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The **Canadian Journal of Educational Communication** is published quarterly by the Association for Media and Technology in Education in Canada, 500 Victoria Road, North, Guelph, Ontario N1E 6K2 Attention: Ron Eyre, Secretary/Treasurer.

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Winnipeg, R3T 2N2

EDITORIALS

FROM THE EDITOR

by Denis Hlynka

As this journal of **CJEC** goes to press, your editor will be firmly settled in an instructional development research project with the Ethiopian Nutrition Institute located in Ethiopia's capital of Addis Ababa.

This project places some specific constraints on this issue of **CJEC.** It is being done while I am unavailable to oversee the final product. I am counting on my colleagues and friends to pinch-hit for me in my absence.

Hopefully this issue will arrive in your hands just before the June conference in Calgary.

Finally, let me note that the **NEXT** issue of **CJEC** will be the last under my editorship. In January 1986, Dr. Robert Bernard of Concordia University will assume this position. Any correspondence about upcoming issues should be forwarded to him.

And now, to introduce this special issue, on the integration of library science and educational media . . . a topic many of you have requested that **CJEC** devote some space to . . . here are Gene Burdenuk, current president of CSLA, and AMTEC's president-elect Ed Crisp.

GUEST EDITORIAL

School Libraries, Standards and Educational Technology

by Gene Burdenuk, President,
Canadian School Library Association
by Ed Crisp, President-Elect,
Association for Media and Technology
in Education in Canada

Preamble:

It might be helpful to the readers of **CJEC** to know how this particular issue developed. Denis Hlynka, editor of **CJEC** approached Gene Burdenuk, president of CSLA in September 1984 and formally invited him to be guest editor of an issue of **CJEC** focusing on School Libraries and Educational Technology. Burdenuk accepted the offer, feeling that this opportunity might form the basis for a national dialogue on school libraries and educational media, and perhaps more specifically would promote discussion on standards for school library resource centres. (This issue appears at a propitious time, since both CSLA and AMTEC are currently investigating the need to revise **Resource Services For Canadian Schools.**) Ed Crisp, president-elect of AMTEC, was recruited as co-editor to provide an AMTEC perspective; the fact that the guest editors are institutional colleagues certainly facilitated the dialogue and cooperation that the task demanded.

It might appear that this issue holds little interest for our constituents outside the K-12 sector. A careful reading, however, will probably reveal some interesting parallels, especially in the area of political advocacy and action.

Introduction:

"It was the best of times, it was the worst of times." Those often repeated words provide an extremely accurate view of the current state of school libraries and educational media in Canadian schools today. We are at the cross roads. This is one of the most exciting times in the history of civilization. The rapidly advancing technology which has brought us from the industrial revolution into the information revolution presents all kinds of possibilities for school libraries. Computer and communication technologies are bringing us closer to the realization of equality of educational opportunity. Our understanding of educational psychology has increased our ability to provide for individual differences and to take into account the variety of teaching and learning styles. Resource-based learning and cooperative program planning and teaching have become entrenched in many of our schools across Canada and Canadian school libraries are being saluted as exemplary models at the international level.

And yet, we are at the worst of times. The back-to-basics thrust, restraints and the accountability movement in education have placed many school libraries in jeopardy. Education for school librarianship programs have been decimated across Canada. School library supervisory positions at the provincial and district level are being eliminated. Teacher-librarians continue to have difficulty in perceiving a clear role for themselves and that role is not being communicated effectively to those in decision-making roles.

Central to our understanding of the role of school libraries in education today is the question of standards of resource services for Canadian schools, for it is these standards that provide the sign posts for direction and guidance. It has been almost 10 years since national reflection, discussion and debate on standards for school library resource centres has taken place. This issue of **CJEC** is intended to stimulate a new discussion, a discussion that perhaps will lead to the creation of standards that will take school libraries and educational media into the 21st century.

In setting out this issue, the co-editors intentionally solicited manuscripts from school librarianship and educational media leaders from across Canada. We thank them for contributing to this national dialogue.

School Libraries, Standards and Educational Technology

In order to come to an understanding of our present, we must first know our past. Frederic Branscombe, co-chairman of the standards committee that produced the original **Resource Services for Canadian Schools,** provides some interesting and insightful comments on the developments that led to the creation of the joint CSLA and AMTEC standards. In so doing, Branscombe presents a snapshot of how the two organizations moved from producing an independent set of standards in 1967 and 1969 to the collaborative effort that created the joint standards in 1977. Branscombe also presents some compelling recommendations for the creation of a new set of standards.

In his thought-provoking article, Ken Haycock questions whether the continuing debate between the issue of school libraries and educational media is productive and whether a return to the promise of **Resource Services for Canadian Schools** might be more fruitful. In setting out a systematic strategy for effective media integration in resource based learning, Haycock has identified six major steps. These include 1) having a clearly defined aim for the program, 2) developing a clear role definition for professional personnel, 3) developing more effective educational training programs for teacher-librarians, 4) developing a unified district approach to support and enhance the individual school resource centre, 5) providing effective inservice staff development programs, and 6) developing a commitment to integrated resource based programs.

Blanche Friderichsen, education consultant with Alberta Education, outlines the lobbying and political advocacy that led to the creation of a policy and standards for school libraries in Alberta. Friderichsen provides a step-by-step analysis that could be used as a model for other jurisdictions seeking a process for achieving school library media legislation. This chronicle of reflective practice highlights the contributions of the various stakeholder groups in coming to a provincial policy. We hear about, for example, the contributions of the provincial library association, a provincial task force on school libraries, the creation of an effective lobby and eventually the creation of a document entitled **Policy, Guidelines, Procedures and Standards for School Libraries in Alberta,** (Alberta Education 1984).

The paper serves as a beacon focusing on the premise that standards are alive and well and finding a strong base in Alberta.

Lorne MacRae addresses the issue of developing new standards and sees this as a challenging opportunity to examine the essential role that the school library occupies within the teaching-learning process. MacRae cautions us of the dangers of losing sight of the integral role of the library to the school program. Other issues identified by MacRae include the argument for and against quantitative standards, the need to accommodate technological changes in any new statements, a need to identify more clearly the role of all school library personnel and their interrelationships, acquisition issues and the area of equality of information access. There is much food for thought in this article and a good starting point for any group embarking on a program to revise standards to lead us into the 21st century.

In attempting to address the international perspective of the new information technology and its potential impact on school libraries, Tom Rich focuses on computer technology and examines its use in school libraries. He concludes that the two major roles of the school library with the new information technology will be the management of educational resources and instruction in the use of these resources.

MEDIA NEWS

Dr. Bob Bernard new CJEC Editor

Beginning with Vol 16 #1, January 1986, Dr. Robert Bernard will become editor of CJEC. Dr. Bernard is associated with Concordia University within the Department of Educational Technology. Future writers for CJEC should be aware of the change of editorship and submit manuscripts accordingly. Dr. Bernard's term as editor is for three years.

New Literature

The National Research Council's Associate Committee on Instructional Technology have issued a new publication titled **Towards a National Policy for a Computer Assisted Learning Industry.** The report states its objective as to "alert governments to Canada's needs for opportunities to develop a computer assisted learning industry; the strategies that might be adopted to strengthen the current capabilities in CAL development and marketing; social and cultural dangers involved in neglecting this sector; and the urgent need for action." More information can be obtained from the secretary, Associate Committee on Instructional Technology Division of Electrical Engineering, National Research Council, Ottawa, Ontario, K1A 0R8.

How To Write Educational Programs for Telidon: A Self Instructional Manual by D. Hlynka, J. Hurly, and P. Hurly is now available on ERIC microfiche ED 244 601. Potential readers should note that the state of the art of programming for Telidon has changed since the publication date of 1982, and that while the document reflects state-of-the art available in Manitoba at publication date, technological specifics have changed, and parts of the document may be dated.

Commonwealth Trust Scholarship Winner!

Danielle Fortosky, head of instructional television at the University of Saskatchewan and member of AMTEC board, has been selected by the Commonwealth Trust Committee to spend three months in Britain studying educational television systems in that country. Congratulations, Danielle!

CALL FOR SUBMISSIONS!

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The Ontario Film Association is now selecting films and video-tapes for the 11th Annual Grierson Documentary Seminar. Recent documentaries on any subject as well as docudramas will be considered.

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Deadline for submission is Wednesday, July 31, 1985.

The Standards Revisited

by Fred Branscombe

There is no bond of union so strong as the bond created by common dangers shared in common.

Sir Wilfrid Laurier

We, whose primary professional concern is the provision and utilization of learning materials, are known by dozens of apparently conflicting titles and job descriptions. For the most part, they are variants of one or other of two basic terms: librarian and audio-visual (or media) specialist. We are usually found polarized in our attitudes toward technology. At one extreme, some eagerly embrace every technological innovation. Others, at the opposite extreme, are openly hostile to every medium except the printed word, which because of its age is deemed to have shed the stigma which it once had as an unwelcome new technology.

These differences among us are understandable. We are the heirs of two separate traditions. The corporate voices for those two traditions are the Association for Media and Technology in Education in Canada (formerly the Canadian Audio-Visual Association and later the Educational Media Association of Canada) and the Canadian School Library Association (a division of the Canadian Library Association).

The first criteria used in Canadian schools regarding the provision of learning materials were imported, typically, from the United States. This was the 1945 publication **School Libraries for Today and Tomorrow,** produced by the American Library Association. Importation from the United States was still the practice in 1960 with the use of **Standards for School Library Programs** (prepared by the American Association of School Librarians) and again in 1966 with **Quantitative Standards for Audiovisual Personnel, Equipment and Materials** (by the Department of Audiovisual Instruction of the National Educational Association). Not only for reasons of national pride but also because of significant differences between educational goals and practices in Canada and the United States, there was a need for distinctively Canadian standards.

That need was recognized by the newly formed Canadian School Library Association at its first annual meeting, held in Ottawa in 1962. A standards committee was appointed at that time under the chairmanship of Mrs. Helen Donaldson, of the Metropolitan Toronto Borough of East York. It produced in 1965 the **Preliminary Standards for School Libraries.** That document was revised by a second standards committee, with Harry Newsom of Winnipeg as chairman, which arranged for the publication by the Ryerson Press in 1967 of the **Standards of Library Service for Canadian Schools.**

The publication of the C.S.L.A. **Standards** was a notable achievement. It was the first Canadian standards for the provision of learning materials in schools. It was a pioneer, too, in recognizing that books were not the only materials that should be available to teachers and learners. In a bold statement that may seem trite in 1985 but was (in 1967) a vision of the future, Harry Newsom and his collaborators wrote, "The library collection consists of books, disc records, tapes, pictures, pamphlets, periodicals, film strips, film slides, microfilm, charts and museum objects — all materials which might be used to instruct, inspire as well as encourage and facilitate the learning programme. The librarian, as an instructional materials resource person, works with students, instructional staff, administration, parents and community agencies to produce a library programme." True, many of the non-book items in that list were old-timers, even in traditional libraries. Several had attained respectability under the rubric, **Vertical File.** It was an age, however, when myopia and tunnel-vision were often in evidence in administrative decisions relative to non-print library materials in schools. I know of a large urban secondary school where, about the time of the publication of the C.S.L.A. **Standards,** filmstrips were kept (along with cash and the school records) in a walk-in vault in the main office and were lent from there by a secretary one at a time as needed, which (not surprisingly) was infrequently.

The members of the Canadian Audio-Visual Association welcomed the appearance of a Canadian volume of standards for learning materials. They applauded the recognition of the universality of needed materials, without distinction as to format or medium. They were disappointed, however, with what they considered to be the inadequate recognition of the need for local production of non-print materials. This was particularly true in the case of production by students where the learning value was in the process, not in the product. It was feared that this shortcoming might cause serious harm, were it come to be accepted that the responsibilities of the "instructional materials resource person" went no farther than "to acquire books and materials" and " to organize these materials for effective use."

C.A.V.A. decided that there was an urgent need for a comprehensive presentation of the needs for and the difficulties in, a fully developed program for the production and distribution of non-print materials. By the time that a book was produced to meet this need, the organization had changed its name to the Educational Media Association of Canada. In partnership with E.M.A.C., which produced the manuscript, Pergamon of Canada Ltd. published in 1969 **Media Canada: Guide Lines for Educators.** The book, which was edited by James Miller of the Borough of York in Metropolitan Toronto, was well received and enjoyed a second printing in 1970.

Together, the C.S.L.A. **Standards** and E.M.C.A.'s **Media Canada** provided much more reliable guidance than either volume did on its own. Both books had areas of outstanding value, resulting from the particular professional competencies of those who produced them. Unfortunately, each book had blind spots reflecting the specific training, experience and interests of its authors.

The C.S.L.A. **Standards** was progressive in its advocacy of the unification of print and non-print collections and programs, whereas **Media Canada** appeared to champion the already outmoded concept of complete separation. Where the **Standards** gave little or no leadership relative to materials production, **Media Canada** provided recommendations covering every conceivable eventuality. Conversely, **Media Canada** was mute concerning how to classify, catalogue and arrange non-print materials so as to facilitate their effective use, whereas these were areas of particular strength in the C.S.L.A. **Standards.**

At its 1971 Annual Meeting C.S.L.A. decided that the time had come to have a revised edition of its 1967 **Standards.** To improve its credibility in advocating the unification of print and non-print collections and services, it included in a newly appointed standards committee four members who had outstanding credentials as audio-visual specialists. The chairman was Harry Newsom, of the School of Library Science, University of Alberta, Edmonton. This was a well balanced committee. Except for one problem, it could have produced a set of standards for instructional materials, equally usable relative to learning materials is all media.

The problem was that, regardless of the book's merits, it would not have been acceptable to all to whom it would have been addressed. No matter whether it had been published under the auspices of C.S.L.A. or E.M.A.C., the members of the other association would surely have seen it as a subversive plot to seize, or to keep, hegemony (depending on how things were organized locally) in the learning materials program in the local school system. If C.S.L.A. had published its own revised edition, E.M.A.C. undoubtedly would have had one too, complete with chapters in the areas where it had been weak previously.

It was obvious that the need was not for separate second editions of the two books of standards, each competing with and undermining the other. The time was opportune for C.S.L.A. and E.M.A.C. to follow the example in the United States of the Department of Audiovisual Instruction and the American Association of School Librarians when they jointly published the **Standards for School Media Programs** (1969).

By a happy coincidence I had an opportunity in 1971 to say in print what many members of both E.M.A.C. and C.S.L.A. were saying privately. I had been asked by **School Progress** to write an article on the interface of librarians and audio-visual personnel in Canadian education. I took advantage of the opportunity to say of the two Canadian books of standards, "There is an urgent need for the different, though complementary, competencies of all the contributors to both books to be concentrated on the production of a new set of media standards for Canadian schools, having the best elements of both existing publications. This is no idle dream. It can be done cooperatively by the Canadian School Library Association and the Educational Media Association of Canada."

During the autumn of 1971 the executives of E.M.A.C. and C.S.L.A. explored the possibility of both organizations laying aside their plans to publish revised editions of their respective books of standards, in favor of an entirely new book to be published jointly by the two associations. These preliminary conversations led to a formal agreement by C.S.L.A. and E.M.A.C. to sponsor jointly the writing and publishing of a comprehensive book of standards for resource services in Canadian schools. To this end it was agreed that the committee that was to implement the decision, as well as its sub-committees, would have two co-chairmen, one from each of the sponsoring associations. Gordon Jarrell, president of the Educational Media Association of Canada, invited me in January, 1972, to be the national co-chairman, who was to represent E.M.A.C. Harry Newsom, the chairman of the existing C.S.L.A. standards committee became the other co-chairman.

Having witnessed some of the mighty rows over petty disputes between media people and librarians at local and state levels in the United States, I found the first meeting of the Joint National Standards Committee in Winnipeg early in 1972 to be truly memorable. With four representatives from E.M.A.C. facing over a dozen C.S.L.A. members, I concluded that we were not about to win anything that the other side of the table was unwilling to hand over. Then a remarkable thing happened that set the tone for that meeting and all the rest that followed until the publication of the book in 1977. Harry Newsom proposed that questions be settled by consensus, rather than by voting. Furthermore, with the approval of his C.S.L.A. colleagues, he announced that where it was impossible to avoid a formal vote, only as many C.S.L.A. members would vote as there were E.M.A.C. members voting. That established a solid trust and mutual respect which soon obliterated all distinctions based on association loyalties. In the few votes that the national committee had in five years, the division was never along organizational lines.

Contributors of ideas and authors of the text of **Resource Services for Canadian Schools** were organized on a two tier basis. Content committees were established according to what would become chapters of the book. Two co-chairmen (one from each sponsoring association) and the remaining members of each of these sub-committees were chosen on the basis of (1) maintenance of a balance between E.M.A.C. and C.S.L.A. members and (2) residence within a reasonable distance of each other so that the work could be done without undue inconvenience or cost. These content groups generated ideas and expressed them in position papers which formed the basis of the text which was eventually developed.

The co-chairmen of the sub committees on content were: Richard Bell (Calgary), Malcolm Binks (St. Catharines), Gerald Brown (Winnipeg), Louise Burgess (Toronto), John Church (Vancouver), Anne Davidson (Regina), Heather-Belle Dowling (Edmonton), Doris Fennell (Toronto), Harry Greaves (Toronto), Norman Guilbert (Winnipeg), Kenneth Haycock (Guelph), Ian Hose (Toronto), David Jenkinson (Winnipeg), Neil Nelson (Toronto), Gwendaline North (Calgary), Ray Rycroft (London), Barbara Smith (Mississauga), John Stoeber (Calgary), Marjorie Szollosy (Toronto), and John Wright (Edmonton).

In addition to the general supervision of the project, the national standards committee had the responsibility of determining the basic philosophy of the book. This involved reconciling minor differences in the recommendations of the sub-committees so as to produce a unified text. The members of the national committee were: Kenneth Bowers (Edmonton), Fred Branscombe, co-editor (Toronto), Agnes Florence (Winnipeg), Gordon Jarrell (Toronto), Gordon McLean (Fredericton), Lawrence Moore (Kingston), Harry Newsom, co-editor (Edmonton), Margaret Scott (Toronto), Florence Willson (Prince George) and Robert Wylie (Belleville).

Continued on page 23.

Dr. Fred Branscombe is coordinator emeritus of educational media services with the Board of Education for the City of North York. Throughout a long and distinguished career he was a pioneer in the development of AMTEC and its precursors, CAVA and EMAC, and was active in AECT and its precursor DAVI in the United States. Fred is well known as the co-author, with Harry Newsom, of **Resource Services for Canadian Schools.** Now officially retired, Dr. Branscombe continues to maintain an active interest in AMTEC while pursuing his writing interests.

Curriculum Resources: More Than the Sum of Books and A-V

by Ken Haycock

Abstract

Some would suggest that the "marriage" of library and audio-visual services has not been successful and that the promise of **Resource Services for Canadian Schools** has not been realized. While the integration of services has not resulted in a new paradigm for services, there has been good progress in schools, often in spite of weak professional preparation for these positions through university training and inadequate leadership at the district level. Some significant issues are identified which require addressing before further progress is possible.

Introduction

When I was asked to address the issue of the failed marriage of school libraries and educational media for this special issue of CJEC, I couldn't help but wonder if this was still an issue, and if so why? Is the integration of "library" and "av" the myth that it is sometimes made out to be? Is current reality closer to the means and methods we preferred in the 1960s rather than the 1980s? Are we really making very little progress in entering the educational mainstream as a unified approach to learning resources, undergirding the educational enterprise?

I have perhaps a rather simplistic view of the place of curriculum resources in the teaching/learning process. It seems reasonable to me that each school should have a centralized collection of learning materials, including books, periodicals, maps and other print materials as well as filmstrips, slides, recordings and other audiovisual materials. One would hope that this collection would be selected using accepted criteria for excellence and appropriateness and would be organized for effective use by teachers and students.

This scenario is not at all unrealistic; indeed, without debating the quality of selection and organization of materials in individual locations, this is the case in almost every school in the country. In some jurisdictions these collections are called school libraries, in others school resource centres. These are firmly entrenched in educational thinking and programs as a "good thing".

It further seems reasonable that each school would have a professional teacher in charge of the maintenance and effective exploitation of this collection. Presumably, should logic prevail, this individual would have additional qualifications in the essential areas of administration, selection, organization and effective use of learning resources, recognizing that courses in such subjects are fairly readily available and do add to qualifications for salary purposes. For effective use to take place, we know that this teacher will plan programs with classroom colleagues which integrate the skills necessary for students to handle information logically and rationally, particularly in those essential areas of processing and using information. This resource-based learning is effective for a number of reasons: there is clarity of communication between the teaching partners; skills are clearly specified for teaching and evaluation; the subject context and classroom framework are obvious to the student; two teachers and selected resources are available to the same group of youngsters.

For whatever reasons, however, this personnel factor has not entered that mainstream of educational thinking in some parts of the country. Most schools do have the collections and facilities; some have staff to manage the collection; fewer have professional staff to ensure that the collection is used; still fewer have the qualified professional staff trained in this exploitation; and still fewer again have the qualified professional staff, by whatever definition, who are committed to effective use through integration with instructional programs and cooperative program planning and team teaching.

It is now a full decade since the national review of the direction of library and media services which resulted in **Resource Services for Canadian Schools.** I recall quite clearly the anticipation and hope surrounding a new paradigm of resource-based learning, not only integrating library and audio-visual services but in fact creating a better approach to leadership in the selection and use of learning resources in the school. The personnel recommended for the school resource centre included a learning resource teacher who would work logically, effectively and persistently toward these ideals. There was even serious discussion at the time of calling this individual an "animature" to further define expectations for change.

Where did we go wrong?

What is the Problem?

Has there really been an unhappy marriage of school libraries and educational media? I think not. The school library, or more appropriately resource centre, is a place which houses educational media, including print and audio-visual materials. Few libraries include only printed materials yet stereotypes persist that libraries are for books. Perhaps the marriage is secure but the offspring not yet produced; the offspring being that new paradigm or philosophical construct of the place of resource-based learning in the school and the role of the teacher-librarian (or learning resource teacher, if you will) in fostering it.

Terminology

The common link between school library specialists and audio-visual specialists is of course teaching and learning; this link is even more obvious between members of either group and their classroom colleagues. Why then do we alienate ourselves and our services from this mainstream by creating barriers through jargon? Perhaps "learning resource teacher "was too advanced for its time and was confused with special education teachers in some jurisdictions. "Teacher-librarian", the CSLA term adopted in 1982, does at least include reference to the teaching component; but why "librarian" when referring to the innovative, effective teacher? Why "library" when referring to the school's collection of learning resources, particularly when many have their own vision of a library from experiences outside of schools? Why "library skills" when "information skills" designate more clearly the function envisioned?

Qualifications

The policy statement of the Canadian School Library Association on **Qualifications for Teacher-Librarians** includes nine areas of competence. Throughout the document the terms "learning materials" and "learning resources" are used, yet in the reactions from leaders in instructional technology the proposed policy was consistently termed book-oriented and library-oriented. The only rationalization for this problem was the rather obvious bias with which the document was being read (if it's coming from the CSLA insert "book" whenever you see "learning resources"). Another example, from leaders in both sectors, pointed to the lack of mention of newer technologies and how terribly backward this was, yet the document does not say that information is to be organized manually, or that information retrieval is to be limited to printed pages. We all have our biases and we recognize this, but occasionally we don't see as clearly or as objectively as we might, due to these ingrown layers of interpretation.

The policy statement does specifically point to the need for competence in the following nine areas:

* administration of the learning resource program
* selection of learning resources
* acquisition, organization and circulation of learning resources
* reading, listening and viewing guidance
* design and production of learning resources
* information and reference services
* promotion of the effective use of learning resources and services
* cooperative program planning and teaching
* professionalism and leadership

These areas were defined following considerable consultation with leaders in the field. There would appear to be no issue with the areas outlined. One need ask then if these areas are being developed in the programs which educate teacher-librarians and learning resource specialists.

When integration of materials and services is so prevalent at the school level why is it so singularly lacking at the university level? Can we say with confidence that graduates of these programs can articulate information skills, including critical listening and viewing skills, in a developmental continuum, and that they not only understand the need for working with classroom teachers, but also have the skills necessary to develop foundations for program development and strategies for effective team planning and teaching? Decidedly not.

What kinds of experiences are being provided to candidates in these programs to ensure a common philosophy and the strategies for developing an integrated learning resources program? And, if the universities aren't providing adequate professional preparation, is the district committed to staff development programs to compensate for this?

This issue becomes even more prevalent at the district level with program leaders who may share a background in teaching but have significantly different professional educations in teacher-librarianship and audio-visual services, resulting in different professional socialization, associations and networks.

District Networks

Major issues in approaches to service which occur in systems with separate library and audio-visual services can almost invariably be traced to the way in which the system is viewed. Are district services designed to support, connect and enhance the school resource centres in the district or are district services designed to serve individuals in schools directly? Too many district resource centres, and their coordinators, still focus on differences in philosophy and approach of teacher-librarians and audio-visual specialists while refusing to draw those centres and that personnel into a cohesive, unified system which recognizes differences but supports programs with the best that the total system has to offer. Teachers should be able to look to their school resource centre to serve needs, recognizing that that centre fits into a larger system in a planned, efficient way.

Medium or Message?

I suppose there are still those who focus on the medium, whether it be microcomputer software, films or children's books, rather than the appropriateness of the medium for the specific needs of the teacher/learning design. And there are those who are "married" to one medium without recognizing the strengths and weaknesses of each and their often unique purpose. This, it seems to me, has less to do with a preference for children's literature or video production than a sadly lacking understanding of the components for effective program development and the cohesion necessary to foster a school-based approach to information handling, which not only recognizes, but also takes into account, different learning styles to attain the same objectives.

Whose Skills? Whose Program?

Teacher-librarians are focusing more and more on information skills and their place in the curriculum. There is no question, however, that the skills of effective listening and viewing are not being addressed in proportion to their significance. More support is needed here from university faculty and district coordinators, not in terms of teaching packages for classrooms but rather in developing the ability of the teacher-librarian to work with colleagues with the object of integrating these various skills into instructional programs. Again, ignorance of the abilities and skills necessary to foster a program, or alternately, recognition of these needs as a priority, are equally applicable, regardless of medium preference.

New Technology

Perhaps the differences among learning resource personnel are becoming more apparent as opportunities exist for the extremists to make their case for or against microcomputers. The "bookies" play hard to get and hard to find in developing their own computer competence (let alone leadership), while the "hackers" merrily forget all else in order to gaze fondly at the equipment and develop computer programs. These are extremes to be sure, but at the school level at least we need more professionals who are comfortable with new opportunities, but who also recognize both the potential and the pitfalls of current applications of new technology for administration and instruction.

Conclusion

While it is feasible to sit around and

Continued on page 22.

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Towards Provincial Standards: The Alberta Experience — Mission Possible

by Blanche Friderichsen

Abstract

Lobbying and political advocacy have resulted in Alberta Education's Minister, David King, approving **Policy, Guidelines, Procedures and Standards for School Libraries in Alberta.** Vested interest groups, along with Alberta Education initiatives, have resulted in considerable action to improve school library services and programs in spite of financial restraint.

Against a background of financial restraint and the continuing erosion of teacher-librarian positions, Alberta's Minister of Education, David King announced approval of a School Library Policy in November, 1984. At that time he acknowledged that "an effective school library can have a major influence on a student's academic achievement."

Policy Guidelines, Procedures and Standards for School Libraries in Alberta (Alberta Education, 1984) is but one of a number of steps recently taken by the Department of Education to improve the quality of education in terms of the management and financing of education. Major departmental thrusts are in four dimensions: 1. The legal framework of the education system; 2. The management of education; 3. Program considerations with an emphasis on results, and; 4. Effectiveness of teaching — learning process.

The school library policy initiative falls under the dimension of Program Considerations which are intended to affect students directly or indirectly.

Blanche Friderichsen is an education consultant with Alberta Education in Edmonton. Her career includes experience in public library and university library settings as well as school libraries. She has been active professionally in library associations at the local, provincial, national and international levels, including C.L.A., A.L.A. and I.A.S.L. (co-chairman, International Association of School Librarians conference, 1982).

STATUS QUO

Alberta is divided into 149 local school districts, each with a school board and a superintendent. Provincial funding is provided to these local districts who have considerable administrative control over their schools. However, in most districts funding is decentralized to the individual school where the principal, in cooperation with the staff, determine how the funds will be allocated. This has led to a diversity of school library services and programs ranging from dismal, to what some have described as lighthouse programs in North America.

A recent provincial survey of its 1648 schools reveals that of the 1386 schools reporting, over 100 do not have a school library. Of those schools with a library, 42 percent are administered by a teacher-librarian half-time or more. The remainder are administered by a library technician (16 percent) or clerical (42 percent). Most clericals have little or no library or teacher education; 92 percent of the teacher-librarians do not have the minimum qualifications recommended by the new standards (8 half courses in librarianship and instructional technology). Facilities range from "showcase" to non-existent, and collections of resources from sophisticated to a close competitor for an 'archives of the decade' award.

Alberta administrators are probably not very different from their colleagues throughout Canada in the importance they place on having a library in the school. From that common goal there are varied perceptions as to the real function of a school library. Few Alberta schools have developed goals and objectives for library services, and fewer still have policies in place for collection development. This situation is perhaps understandable when one would be hard pressed to even find the word "library" in any of the Alberta Education curriculum documents or statements of educational policy.

ACTION

Scene 1

The mission for improved school library service began to look possible in 1982 when the Library Association of Alberta orchestrated an informal luncheon with a dozen school librarians at the annual library conference, and invited the Minister of Education not to speak, but to enjoy the food and fellowship. A frank and lively discussion about school libraries ensued. That evening, when the Minister spoke to the entire association, he publicly announced that libraries are important to the school system, but Alberta Education had never said this, and he intended to change that position. And so school libraries became part of a major review of educational programs, legislation and financial administration that has been an on-going activity for the past two and a half years.

With a little help from the two provincial associations for libraries, the mass media provided the visibility required for school library issues to become a more prominent educational topic for educators and the general public than ever before.

Scene II

True to his word, the Minister struck a Task Force on School Libraries with a mandate to:

1. Identify the major problems and issues affecting school libraries.
2. Identify the alternatives for the resolution of these issues.
3. Advance a position with respect to these alternatives.
4. Describe the major characteristics and services of an effective school library.

Traditionally one would have expected a Task Force membership of persons with a vested interest in school libraries, or the typical procedure of representation from stakeholder groups such as superintendents, school trustees, and the teachers' association. Instead, the committee was composed of four associate directors of curriculum, with peripheral knowledge or experience in school library services, and one representative of the vested interested group. This was a less costly approach, because travelling expenses and honoraria for committee meetings were not necessary. It proved to be a good combination. Not only did it raise awareness about school library services among key persons associated with curriculum, but also it provided a wider perspective for committee deliberations.

Scene III

By the end of 1982 the Task Force position paper was completed and sent to the Minister with a recommendation that it be widely distributed. The Minister preferred a low-key stance and only invited response from five key stakeholder groups — school superintendents, school trustees, the Home and School Association, the provincial library association and the provincial teachers' association.

These groups were asked to react by June 1983 to two questions: 1) Does the paper identify the key issues for school libraries in Alberta at this time? and 2) Are the five issue statements appropriate and valid?

In essence, the position paper reiterated the wide disparity in both quality and quantity of school library services to students in the province and identified five interrelated issues for discussion.

Issue 1: What should be the role of the school library in the overall instructional program of the school?

Issue 2: Whose responsibility is it to develop policy direction for school libraries, and what kinds of policies are needed?

Issue 3: Who should establish standards and guidelines for school libraries, and should these be expressed in quantitative or qualitative terms?

Issue 4: Is professional direction at the school and/or district level a critical component of an effective library program?

Issue 5: Is there a real shortage of funding to support effective library services?

Again, the provincial library association and the Learning Resources Council (an affiliate of the Alberta Teachers' Association) were not about to let the issuance of this Position Paper go unnoticed. Their action plan extended to all corners of the province and was one of visibility, political advocacy and lobbying. And what better time to lobby than with a provincial election planned for October 1983?

The parameters for affirmative action to keep school libraries in the public eye were set as a result of two significant activities. The first was an invitational symposium, sponsored by the Learning Resources Council (L.R.C.) to hear varying points of view prior to formulating their response to the Position Paper. A copy of the L.R.C. response, which was an outgrowth of this symposium, was sent to all Members of the Legislature and to the Deputy Minister of Education.

The second significant activity was a speaker at the 1983 annual library conference who detailed how marketing and organizational behavioral theories can be applied to promote school library issues to decision makers.

This speaker also chaired the provincial library association committee, whose decision it was to devote the major portion of their 1983 annual brief to the government to school libraries.

As a follow-up to this presentation, members of the L.R.C. hosted coffee and dessert sessions to write letters to government members to reinforce the points in the brief. They also mounted an awareness campaign which suggested arranging for M.L.A.'s to visit their local school libraries. They formed citizens' committees and encouraged teachers to get kids talking about their school library at home. Furthermore, they advocated contact with all candidates for the October elections to insure they understood and would support library issues. Not overlooked was the leverage parents have in influencing many vital decisions.

To facilitate this contact as well as to provide a basis for discussions with local M.L.A.'s, parent groups, public library trustees and the media, a short document was prepared. It outlined the issues facing school libraries and emphasized the importance of students becoming information literate as a prerequisite to lifelong learning.

All of this, combined with a very positive and consistent response to the Position Paper not only from the stakeholder groups, but also from concerned parents, citizens and teacher-librarians, led to the Minister asking the Task Force to reconvene and prepare another paper setting out policy, guidelines, procedures and standards for Alberta school libraries. Members of the L.R.C. wrote to the Minister to let him know they were encouraged and excited by the Task Force recall. The policy paper was completed in March 1984, and received wide distribution.

At the Alberta Library Association Conference held in the spring of 1984, copies of the completed policy paper were made available, and the Minister of Education was invited to become honorary president of the association. Learning Resource Council members continued lobbying their M.L.A.'s, which led to a private members' bill dealing with school libraries. This bill was not passed, but it served to inform all members of the government of the need for improvement in school libraries.

Included with each copy of the policy paper was a questionnaire asking for responses based on a five point Likert scale. Forty-three percent of the 4500 respondents agreed or strongly agreed with the proposed policy. Seventy-nine percent considered the policy absolutely essential.

Scene IV

The format and succinctness of the final document, **Policy, Guidelines, Procedures and Standards for School Libraries in Alberta** (Alberta Education, 1984) is in keeping with the new Alberta Education Management and Finance Plan. The funding structure of this Plan will allow greater autonomy to local school boards to determine how provincial funds will be used to meet student needs. At the same time, school boards will be more accountable through annual reporting of their programme and service results to Alberta Education.

The new library policy states that students in Alberta schools should have access to an effective school library program. It also maintains that the library program should be integrated with regular instructional programs in order to provide students with improved education opportunities.

The guidelines and procedures set out the responsibility of school boards and of Alberta Education. School boards will bear the responsibility for developing, implementing and assessing the guidelines, procedures and standards.

For its part, Alberta Education will assist school jurisdictions in carrying out these tasks by making available to them recommended implementation models and inservice materials, suggesting areas of research related to school library services, and including in its new or revised curriculum guides ideas on how to integrate the library program with curriculum goals. The department also will "endeavor" to provide consultative service to local school boards.

Continued on page 22

Standards: Aiming Towards Tomorrow

by Lorne MacRae

There is a need to consider the publication of revised, enlarged and futuristic standards to guide the development of school media programs in Canada. Such consideration is essential and long overdue. A developing foundation of credible research, rapid technological change, the altering expectations of students, teachers and the public — all indicate that every consideration should be given to the development of useful and visionary standards. Such standards would outline achievable goals and suggest realistic practical strategies to achieve those goals. There must be statements of clearly defined roles, responsibilities, and relationships — for teacher-librarians, library technicians, library clerks, central support systems, provincial departments of education, university faculties and for newly defined fiduciary obligations of federal departments and agencies.

> "Although some people dismiss the concept of standards of excellence as unrealistic in the actual world, there is a need for a vision of the educational program as it should be, even though its achievement may seem impossible. . . . We need standards to help us determine if our present course is a wise one; program goals provide a sense of direction even though we may be able to move only a short distance." (Elizabeth Fast; **School Media Quarterly,** Winter, 1976.)

In an editorial entitled "Take Another Look" (**Canadian Library Journal,** April 1983, p. 59), Art Forgay placed a call for the development of new standards squarely before the membership of the Canadian Library Association. Forgay points out perceived ongoing concerns about the lack of quantitative statements in the 1977 document jointly produced by CSLA and AMTEC — **Resource Services for Canadian Schools** (Edited by Frederic R. Branscombe and Harry E. Newsom, McGraw-Hill Ryerson Ltd., 1977). Although Forgay salutes the development of **Resource Services for Canadian Schools,** he says that, "as with any such document, questions were raised during and after its publication regarding the methods used and the degree to which it had achieved its mandate", (**Canadian Library Journal,** April 1983, p. 59). Unfortunately, these questions and some considerable difficulty in interpreting the document for useful local development gave it a much shorter lifespan than the scope the document deserved.

Jane Anne Hannigan in "School Media Standards" (**Library Trends,** Summer, 1982) points out concerns similar to those raised by Forgay, but in reference to **Media Programs: District and School** (American Library Association/Association for Educational Communications & Technology, 1975). In addition, she deftly highlights a major concern, one that both documents failed to address thoroughly or reasonably, and one that must be addressed in any new document: "the standards have for years skirted the issue of teaching . . . nowhere has the profession determined the scope and sequence of our responsibilities to students and to the schooling process. We have continued to suggest that learning the location and use of simple materials or library skills is our goal, forgetting that finding or obtaining access to information is only a relatively small and, to some extent, an insignificant part of the need of an individual learner confronted with information." (Jane Anne Hannigan, "School Media Standards", **Library Trends,** Summer 1982, p. 53-54).

Both Forgay and Hannigan suggest that new standards must of necessity look at the technological changes impacting upon schools and must consider the impact that technology promises — good and bad — upon societal concerns such as that represented in our dichotomous need for access to information and our need for privacy. Previous standards have tended to be glib about or to ignore the potential negative impact that improved models and strategies of telecommunication promise with ease and can now deliver with rapidity. Easy and relatively inexpensive access to databases necessitates an examination and evaluation of both appropriate and reasonable access. "The school media specialist will (also) have to face an increase in electronic publishing and determine how the user of informational and imaginative content will cope. We have developed some interesting approaches to criticism of literature and film, but we have not begun to determine the criticism necessary for assessing the computer software that is now published and which will undoubtedly escalate. The new standards will have to deal with this question in a more realistic fashion than have our earlier attempts to cope with technology, as witnessed by the failure to deal effectively with film." (Jane Anne Hannigan, "School Media Standards", **Library Trends.** Summer 1982, p. 55).

As Hannigan states, previous documents have overlooked offering articulate statements about the integral relationship of the school library to learning, teaching, effective education, life-long learning, student attitude, and student achievement. Nor have previous documents clearly delineated useful models that outline the benefits to be gained by employing strategies that address learning styles, models of teaching, flexible scheduling, resource sharing/networking and cooperative program planning.

If the present economic climate has had any positive impact, then perhaps it is the fact that it has required teacher-librarians and school administrators to reassess and redetermine the foundation upon which a good modern school library program must exist. The conditions of the present carry with them a strong call to identify the fundamental services of a good school library program and then to define what that program requires as it moves into a future that quickly becomes tainted with obsolescence!

New standards must examine the role of all school library personnel and their interrelationship. The teaching component of the role of the teacher-librarian must be carefully outlined and appropriate certification models suggested. Teacher-librarians are **not** public librarians and the educational requirements of both are different. Although there may be some overlap in the specific course requirements to be a librarian, it is **not** the overlap, but the substantive difference that requires attention. D. Philip Baker addresses this concern in **The Library Media Progam and the School** (Libraries Unlimited, Inc. 1984). He discusses the competencies of a library media specialist as outlined in **Media Programs: District and School** and states . . . "to prepare a capable professional in each of . . . fourteen strategic areas during a one — (or even two) year preparation program is about as easy as teaching elephants to fly. In reviewing these competencies, which national professional associations maintain that a professional must possess, one is struck especially by two matters. The first is that, after all the rhetoric is discarded, these are activities that the library media specialist does daily. The second is that if a year of formal academic training to prepare a professional is not enough, then ten years is not enough either." (D. Philip Baker, **The Library Media Program and the School** Libraries Unlimited, Inc. 1984, p. 27-28). Any new standards must assist to identify the areas where competencies are essential and patterns of certification where such competencies can be achieved.

Any new standards must not only address the desired role of the teacher-librarian (and the relationship of that role to the school program as more typically and traditionally defined), but also must emphasize the need for staff development — of the teacher-librarian, of the teachers, of the principal, of the Superintendent! Such staff development must be broad in its concept, but definite in its statement of need for ongoing commitment. It must permit for the opportunity to learn about the "new basics" that technological innovation requires and for the inclusion of the opportunity to become specialized in those areas that newer strategies of teaching and newer theories of learning require. Such standards must also promote and incorporate a full understanding of the role of the principal as an effective agent of change and the relationship of the teacher-librarian as an equitable partner in the staff development initiatives that accompany such change.

Without clearly defined statements that specify the integrated role and relationship of the teacher-librarian to teaching and learning, it is quite possible that the promised technological release from burdensome administrative detail will be significantly diminished as the requirements for new schemes of organization and the possibilities offered by automated advantages once again occupy the major time commitments of school library staffs. Central service assistance can ensure support for a diminished school-based technocratic organizational role, while at the same time permitting school-based staffs the enhanced, enlarged and essential opportunity of working appropriately with students and teachers.

The promise of the next twenty years requires new considerations to be raised in relationship to the acquisition of collections that will serve students and teachers. The application of selection criteria to the acquisition of all resources will occur within the process of collection development policies, procedures and implementation plans at both the school and district level. These collection development plans must necessarily address the need to provide resources that meet the traditional expectations attached to reading, viewing, listening, speaking and writing and that prudently address the growing and necessary utilization of newer modes of information delivery and information processing.

There is a need to carefully examine the access to information via data bases that students and teachers must have. School-based needs for data access will be complicated by the growing home access to information delivery systems. Many schools will house student populations who will be individually information-rich. Other schools will cope with students noted for their limited personal access to information sources. The continuing trend of school decentralization exacerbates the possibility of information poverty. School boards, provincial and federal governments must ensure information equity.

Information equity must be addressed within the broadest context of the resource collection. The entire scope of the school library collection including online access must be developed as part of a collection development plan. The days of rapid and frenetic provisioning should be replaced with thoughtful program-based collection development plans that address the needs of the learner and support the curriculum in a long-term fashion. Jacqueline C. Mancall and Christopher C. Swisher suggest that "one of the clearest ways to visualize collection development is to look at it as a process." ("Developing Collections for the Eighties and Beyond". **School Library Media Annual: 1983,** Vol. 1; edited by Shirley Aaron and Pat R. Scales). One model they cite, (Edward G. Evans, **Developing Library Collections,** Libraries Unlimited, 1979, Littleton, Colorado), for examining this process suggests that there are six universal elements that must be considered: 1) analysis of the library's patron community; 2) preparation of a collection development policy based on the findings of the community analysis; 3) selection or identification of materials to be acquired; 4) the actual acquiring or acquisition steps; 5) weeding, or the removal of items no longer useful; and 6) evaluation or assessment of the value of the collection to its users.

The concepts and principles outlined and supported by Mancall and Swisher are the substantive stepping stones providing for a collection that will adequately and generously provide for students and their teachers. These principles must be reflected in any new standards and they must become accountable expectations at both the school and district level. The application of these sound management principles ensures collections that are both relevant and useful.

Standards are often used to evaluate collections. This appears to be based on the belief that "more is better" and that quantity is a predictor of quality. . . . The problem with this type of reasoning is, of course, that size alone is certainly no indicator of the collections' ability to respond to demand. A large collection of obsolete, little used items is worth less than a very small, highly used collection." (Jacqueline C. Mancall and Christopher C. Swisher, "Developing Collections for the Eighties and Beyond," **School Library Media Annual — 1983:** Vol. 1, Editors: Shirley Aaron and Pat R. Scales, p. 261). There can be no argument that collection relevance is of greater importance than collection size. However, when the principles espoused by Mancall and Swisher are applied with the techniques of a program-based budgeting model, then collections of the future will be collections of considerable impact.

Quantitative assessments can be helpful, but usefulness will be determined by using strategies that address the future. The Calgary Board of Education, Media Services Group has assisted schools with such a program-based budgetary approach to collection development and resource acquisition for two years. In those schools where the strategy has been conscientiously employed,

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School Library Resource Centres and the New Information Technology: The International Perspective

by Tom Rich

One thing that anyone who deals with technology knows is that jargon is king. Thus, an explanation of mine. The short title of this paper is really — **SLRC and the NIT.** I am using the British term "school library, resource centre" (SLRC) for what we still have trouble naming — library, resource centre, learning centre, etc. Secondly, with a bit of discomfort, I am using the term "new information technology" (NIT) now currently in vogue. This encompasses the use of computers and television and the various combinations of the two with an emphasis on the computer aspect.

The very act of gathering and putting together information on this subject involved technology and illustrates some of the changes we all have faced in the past several years. Just a few years ago researching a subject involved hours in the library searching through reference sources and more hours copying the information by hand and using a typewriter. Gathering information for this article was different. My literature search of ERIC and LISA was conducted on-line using a computer. Those items I wanted that were not in the local library were acquired through inter-library loan accessed using an electronic message network. All of the actual writing was done at a word processor, my abominable spelling checked by a spell check program. The equipment involved to do all this can cost as little as $1500 in total.

Yet, for all this, I found little in the literature to help me understand the impact of the NIT on the SLRC. Certainly, there is a plethora of articles extolling the virtues of computers and the changes they may cause in the library resource centre (Boss, 1984; Craver, 1984; Roberts, 1982; Sawson, 1982; to name a few). However, little information exists on exactly what the impact is to date. In fact, one is left with the impression that, outside of one or two small areas, the average school library resource centre is largely untouched by the impact of computers and affected by television in no more dramatic fashion than by the introduction of films to education more than 40 years ago. Although the majority of articles we were able to find concerned Canada or the U.S., the evidence is that this situation prevails internationally as well as in North America.

My intital impressions regarding what is **really** happening were mostly based on information gathered at the Centre for Educational Research and Innovation (CERI) "International Conference on Education and the New Information Technologies" which took place in Paris in July 1984 and on the multitude of background papers prepared for that conference. Regrettably, although I will quote from several of them, I do not believe they have been publicly released. The lack of international information we found in the publications we had access to led us to gather additional information by surveying a number of countries. Finally, my thoughts were crystalized by a British publication I highly recommend, **Information Technology and the School Library Resource Centre,** published by the Council for Educational Technology (Gilman, 1983).

A large part of the question regarding the impact of the NIT on the SLRC focuses on the fundamental question of the use of computers in education. Without a doubt, the primary impact of computers on education to date is in the emphasis on what has come to be called computer literacy. Although much has been written and said about the potential for the actual process of education being changed by the NIT, in no country has this come about in any widespread sense. Rather, the computer has become a subject of study and skills training. This in no way changes the role or process of education. It simply introduces a new subject of study.

It is useful to quickly review the international situation relating to the use of the NIT in the school. The CERI (1984) paper **The Introduction of the New Information Technologies in Education: Policy Trends and Developments in Member Countries** reviews the current status and trends for the future in the DECD countries. The area receiving the most emphasis has been the teaching about computers particularly as it relates to the skills needed for work. However, the amount and the specific approach (awareness, literacy, computer science, vocational approaches) vary considerably.

While the introduction of the NIT is well under way in most developed countries, the speed with which it is being done differs. In general, only the earliest stage of use has been reached although in many countries a sizeable investment in both time and money has been made (CERI, 1984). In their review of the situation, the CERI Secretariat suggested, "Looking at the vast amount of problems waiting for solution at all the levels from policy formulation to classroom practices it is difficult to avoid the feeling that if more has indeed been done, much more is still needed to complete the task" (p. 23). They further suggest that much more educational experience and knowledge relating to the NIT is needed before appropriate decisions can be made.

No one country has an overall solution to the use of NIT in education. However, as reported in CERI's (1984) review of policy trends in this area, France and the United Kingdom would appear to be the most advanced by virtue of their unitary approaches. Both have attempted to coordinate the entire process of the introduction of computers to education with a national policy while still leaving room for local initatives. Both programs also place heavy emphasis on providing equipment to schools, curriculum development and teacher training.

Where do the library resource centres stand in this process? For most countries this is extremely difficult to determine. Some of it relates to the difficulty in finding English language literature on the subject. But it would also appear to relate to a different role for SLRCs in some countries and a virtual absence of SLRCs

Tom Rich is director of educational services for the P.E.I. Department of Education, in Charlottetown. He is a long-standing member of A.M.T.E.C. and served as president of the organization in 1982-83. He is currently serving on the A.M.T.E.C. committee for the Symposium on National Concerns. The author would like to acknowledge the assistance of Donna Lavoie in conducting research and in the design of the questionnaire.

COURSES IN

MICROCOMPUTERS IN EDUCATION IN CANADIAN UNIVERSITIES

COMPILED BY
LEN PROCTOR
RICHARD SCHWIER
BARRY BROWN

DEPARTMENT OF EDUCATIONAL COMMUNICATIONS
UNIVERSITY OF SASKATCHEWAN

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INTRODUCTION

This document is the second annual compilation of course offerings on the topic of Microcomputers in Education. The list has been expanded to include course offerings from colleges.

Four central concepts guided the editors in making selection decisions. They were: microcomputers, applications, education and literacy. Thus, a course in which the PL/1 language was used to teach programming on mainframe was excluded while a course in which Basic or Logo may be used to teach very similar concepts was included. The rationale for this decision is that Basic, not PL/1, is the resident language of the vast majority of microcomputers.

The editors wish to thank the respondents for their prompt and complete replies. Without their valued cooperation, a compilation such as this would be incomplete and much of its value for student counselling, reflecting trends and identifying emerging areas of study, would be lost.

Any college or university, not represented in this second annual compilation, should contact the editors immediately to enable us to update the mailing list.

PART A: UNIVERSITIES

ACADIA UNIVERSITY

Inquiries: Dr. Norman Watts, School of Education, Acadia University, Wolfville, Nova Scotia, B0P 1X0.

COMPUTERS IN EDUCATION: This course offers an introduction to the computer and to the uses of the computer in education. The major emphasis of the course is the use of the computer in curriculum and instruction. The objectives of the course are: understand the components and functions of a microcomputer system; operate a microcomputer system; understand how programs work; develop simple computer programs and modify existing ones; evaluate and select microcomputer software for classroom use; understand different uses of the computer in education; understand how to implement computers in instruction. EDUCATION 4466; Credit; Undergraduate; 24 Weeks; Fall, Winter.

UNIVERSITY OF BRITISH COLUMBIA

Inquiries: Dr. David F. Robitaille, Head, Department of Mathematics and Science Education, Faculty of Education, 2125 Main Mall, University of British Columbia, Vancouver, B.C. V6T 1Z5.

MICROCOMPUTER PROGRAMMING I: Uses of microcomputers in education; introduction to programming. CSED 217; 1.5 Credit; Undergraduate; 13 Weeks; Spring, Fall, Summer.

MICROCOMPUTER PROGRAMMING II: Advanced programming in at least two microcomputer languages; educational system development. CSED 317; 1.5 Credit; Undergraduate; 13 Weeks; Fall, Summer.

INSTRUCTIONAL USES OF MICROCOMPUTER: Development and use of computer assisted instructional units in specific subject matter areas. Psychological and sociological foundations for microcomputer applications in education. CSED 417; 1.5 Credit; Undergraduate; 13 Weeks; Fall, Summer.

COMPUTERS IN EDUCATION: Current research and practice concerning uses of computers in education, including computer-assisted instruction and computer-augmented instruction. CSED 400; 1.5 Credit; Undergraduate; 13 Weeks; Fall.

CURRICULUM AND INSTRUCTION IN COMPUTER SCIENCE (Secondary): Curriculum planning; teaching methods and strategies. Pre-requisite: a completed concentration or major in Computer Science. CSED 404; 1.5 Credit; Undergraduate; 13 Weeks; Fall,.

SEMINAR IN THE TEACHING OF COMPUTING STUDIES: Curriculum instruction and organization of computing studies courses in the secondary school. Pre-requisite: Education 491 or extensive experience with teaching computing studies in the schools. CSED 546; 1.5 Credit; Graduate; 13 Weeks; Fall, Summer.

SPECIAL COURSE IN SUBJECT MATTER FIELD: Courses in various subject matter fields designed to bring teachers up to date in recent findings in each field. CSED 565; 1.5/3 Credit; Graduate; 13 Weeks; Spring, Fall, Summer.

EVALUATION OF COMPUTER-BASED INSTRUCTIONAL MATERIALS: Types of computer assisted instruction, identification of critical attributes, analysis of techniques for evaluating these materials. CSED 520; 1.5 Credit; Graduate; 13 Weeks; Spring, Fall, Summer.

DEVELOPMENT OF COMPUTER-BASED INSTRUCTIONAL MATERIALS: Techniques of presentation, response analysis, reprisal, individualization, data management, course management. Course planning and development. CSED 530; 1.5/3 Credit; Graduate; 13 Weeks; Spring, Fall, Summer.

BROCK UNIVERSITY

Inquiries: Dr. R. Crane, Associate Professor, College of Education, Brock University, St. Catharines, Ontario L2S 3A1.

MICROCOMPUTERS IN THE CLASSROOM (Parts 1, 2): Programming, literacy, BASIC, LOGO, CAL, systems design, spread sheet, word processing, simulations, futures. ED 461, ED 462; Credit; Graduate; 24 Weeks; Spring, Fall, Summer.

COMPUTERS IN THE CLASSROOM PART 1, 2, 3: Basic computer literacy, evaluating software, programming, BASIC, LOGO, word processing, simulations systems design. EDUC 461, 462, 463; Full Course Credit; Graduate; 24 Weeks; Fall/Winter, Summer.

CONCORDIA UNIVERSITY

Inquiries: Dr. Gary Boyd and Prof. Jesus Vazquez-Abad, Concordia University, Department of Education, 1455 de Maisonneuve Blvd. West, Montreal, Quebec H3G 1M8.

MODELLING, SIMULATION AND INTELLIGENT TUTORING SYSTEMS: To provide an introduction to modelling and simulation in educational computing; to provide an introduction into the theoretical and practical aspects involved in the development of computer-based adaptive-teaching systems. ETEC 665; 3 Credits; Graduate; 13 Weeks; Spring.

COMPUTER ASSISTED INSTRUCTION: Study of merits and weaknesses in the various CAI projects and systems; preparation and try-out of a CAI conversational programme; preparation of flow-chart illustrating the interdependence of major processes involved in developing and producing CAI course modules. ETEC 564/664; Credit; Graduate; 13 Weeks; Spring.

SMALL COMPUTER SYSTEMS AND SOFTWARE FOR TEACHERS AND TRAINERS: The objective of this course is to enable teachers and trainers to select and use small computers for instructional and managerial purposes. Considerable emphasis is placed on the evaluation selection and customizing of existing studyware and other software. ETEC 563/663; 3 Credits; Graduate; 13 Weeks; Spring, Fall, Summer.

COMPUTER BASED SYSTEMS IN EDUCATION AND TRAINING: The course surveys the application of currently available computers and services to the needs of educational and training administrators, instructional media producers and learners. The emphases are on process knowledge and project and vendor evaluation. ETEC 562/662; 3 Credits; Graduate; 13 Weeks; Spring.

INTRODUCTION TO EDUCATIONAL COMPUTING: An introduction to educational problem-solving and programming using computer languages BASIC and LOGO. ETEC 560/660; 3 Credits; Graduate; 13 Weeks; Spring, Fall, Summer.

DALHOUSIE UNIVERSITY

Inquiries: Prof. Anthony Barton, Education Department, Dalhousie University, Halifax, Nova Scotia.

MICROCOMPUTER LESSON WRITING AND PROGRAMMING FOR TEACHERS: Superpilot, Pilot, C.A.I., Programming Frame Structure, Ruleg System, Apple, C.A.L. ED 565OR; 6 Credit Hours; Graduate 26 Weeks; Spring, Fall.

ADVANCED COMPUTER LEARNING: C.A.L., C.A.I., N.L.P., Neurophysiology Coaching Tutorial. ED 563OR; 6 Credit Hours; Graduate; 26 Weeks; Spring, Fall.

COMPUTERS IN EDUCATION: Basic, Logo, Word-processing, Beginners. ED 5633R; 6 Credit Hours; Graduate; 26 Weeks; Spring Fall.

UNIVERSITY OF GUELPH

Inquiries: Prof. W. Pfeiffer, School of Agricultural Economics and Extension Education, University of Guelph, Guelph, Ontario N1G 2W1.

PRODUCTION ECONOMICS: Economic analysis of production and resource use in agriculture. Emphasis is placed on decision-making by means of economic theory, linear programming, game theory, and budgeting. 02.329; Credit; Undergraduate; 13 Weeks; Spring.

ADVANCED FARM MANAGEMENT: Identification and analysis of problems and opportunities for development of successful management strategies. Farm business analysis, computerized farm planning models and decision theory applied to selected Ontario farms. 02.422; Credit; Undergratuate; 13 Weeks; Spring.

Inquiries: Prof. P. Farragher, School of Agricultural Economics and Extension.

MICROCOMPUTERS IN EXTENSION: Credit; Undergraduate; 13 Weeks; Fall.

COMPUTER BASED LEARNING SYSTEMS: Selected study topics which may be pursued in accordance with the special needs of students in the program. 38.629; Credit; Graduate; 13 Weeks; Spring, Fall, Summer.

NEW TECHNOLOGY AND ITS IMPORTANCE IN EXTENSION/ADULT AND CONTINUING EDUCATION: Review of selected themes in adult, continuing, and extension education. Students will present seminars on assigned topics. 38.630; Credit; Graduate; 13 Weeks; Spring, Fall.

Inquiries: Prof. S. Scott, Math and Statistics.

APPLIED COMPUTING IN AGRICULTURE: Introduction to computing with special emphasis on the use of software packages available on microcomputers. Students will be required to learn BASIC and do assignments. 27.010; Credit; Associate Diploma; 13 Weeks; Spring, Fall.

Inquiries: Prof. A. Dyer, Computing and Information Services.

INTRODUCTION TO COMPUTING IN AGRICULTURE: An introduction to computers with emphasis in agricultural applications. History and elements of computer science and information processing; advantages and limitation of microcomputers and application packages will be covered. 27.120; Credit; Undergraduate; 13 Weeks; Fall.

Inquiries: Prof. G.A.B. Moore, Raithby House.

TECHNOLOGY IN EXTENSION EDUCATION: An examination of the issues involved in using media in formal and non-formal teaching situations. The comparative characteristics will be examined. The system approach to the adoption of teaching strategy will be emphasized. 38.308; Credit; Undergraduate; 13 Weeks; Winter.

UNIVERSITE LAVAL

Inquiries: Mr. Philippe Marton, Directeur, Dept. de Technologie de l'Enseignement, Faculte des Sciences de l'Education, Universite Laval, Quebec, Canada G1K 7P4.

ORDINATEUR ET ENSEIGNEMENT: Historique dur le developpement du domaine des ordinateurs. Description du fonctionnement interne d'un ordinateur. Algorithmes, methodes heuristiques, diagrammes logiques. Langages de programmation. Elements du langage BASIC. Inventaire des applications pedagogiques de l'ordinateur. Elements du langage LEGATO. Procedure d'etree d'un test sur ordinateur. Preparation d'un scenario de dialogue sur ordinateur. TEN-1191; 3 Credit Hours; ler cycle; 14 Weeks; Automne, Hiver, Ete.

APPLICATIONS PEDAGOGIQUES DE L'ORDINATEUR: Etude des applications pedagogiques de l'ordinateur dans le contexte d'une approche dystemique de l'enseignement. L'ordinateur comme outil pedagogique (appareil electronique, calculateur, automomate, simulateur et instrument de recherche pedagoigique), comme instrument de gestion pedagogique (banque d'informations, evaluation, gestion de cheminement, traitement de texte, systemeauteur) et cofmme instrument d'enseignement (exercises repetes, enseignement de type tutoriel, enseignement de type non-directif). Introduction a la programmation en langage BASIC. TEN-17328; 3 Credit Hours; ler cycle; 14 Weeks; Automne, Hiber.

PRODUCTION DE DIDACTICIERLS SUR ORDINATEURS: Langages evolues, langages auteurs et systemes auteurs: avantages et inconvenients. Revue des principaux operateurs de BASIC utiles dan le developpement de didacticiels, Langage PILOT, logiciel pour le graphisme, tablette graphique. Principaux systemes auterus. Development d'un didacticiel en utilisant les divers moyens etudies dans le cours. TEN-17329; 3 Credit Hours; ler cycle 14 Weeks; Automne, Hiver, Ete.

ANALYSE DE DIDACTICIELS: Structuration d'une methode d'analyse simple, souple et adaptable a tout didacticiel utilisable en situation d'enseignement ou d'apprentissage. La methode s'inspire d'un modele linguistique et semilogique. Impact du "langage" de programmation et de l'algorithmique de l'ordinateur sur la structure mentale de l'apprenant. Classification, mise a l'essai et analyse des didacticiels disponsibles. Formulation et experimentation d'un ensemble de "valeurs" a retrouver dans un didacticiel educatif. TEN-17330; 3 Credit Hours; ler cycle; 14 Weeks; Automne, Hiver.

PRACTICUM EN A.P.O.: Projet realise dans le milieu institutionnel permettant a l'etudiant d'integrer et d'appliquer l'ensemble de ses apprentissages par le vecu d'une experience pratique dont l'etudiant doit lui-meme preciser l'objet. Ce projet pourra prendre plusieurs formes entre autres: 1) Animation dans le milieu: aupres d'enseignants, d'etudiants ou de parents. 2) Production d'un didacticiel: en fornction d'un besoin identifie dans le milieu. 3) Cretion d'un repertoire de didacticiels: analyse, description, classification d'un ensemble de didacticiels pouvant s'inscrire dans un programme. 4) Recherche: projet restreint lie a l'utilisation de l'ordinateur dans la formation: analyse de besoins, equete, sondage, evaluation . . . 5) Etc. TEN-17421; 3 Credit Hours; ler cycle; 14 Weeks; Automne, Hiver.

MICRO-INFORMATIQUE ET ENSEIGNEMENT I: Evolution de la micro-informatique et de ses applications pedagogiques. Structure et fonctionnement de l'ordinateur et des diverses unites peripheriques. Explications relatives a l'architecture globale du microodinateur et au traitement informatique a'l; interieur du micro-ordinateur. Caracteristiques fondamentales des principaux langages de programmation. Concept de programmation structuree en relation avec l'utilisation a des fins pedagogiques. Algorithmes, organigrammes, graphiques, solutions de problemes. TEN-17527; 3 Credit Hours; ler cycle; 14 Weeks; Automne, Hiver Ete.

MICRO-INFORMATIQUE ET ENSEIGNEMENT II: Applications pratiques en langage BASIC du contenu vu au cours "Micro-informatique et enseignement I". TEN-17528; 3 Credit Hours; ler cycle; 14 Weeks; Automne, Hiver Ete.

LANGAGES ET SYSTEMES AUTEURS: Langages evolues, langages auteurs et systemes auteurs: adantages et inconvenients. Inventaire de langages et systemes auteurs servant au developpement de didacticiels. Etude d'un langage auteur et d'un systeme auteur. TEN-17540; 3 Credit Hours; ler cycle; 14 Weeks; Automne.

UTILISATION DE PROGICIELS POUR L'ENSEIGNEMENT: Initiation a l'utilisation de progiciels: traitement de textes, chiffrier electronique, bases de donnees. Demonstration des utilisation de la micro-informatique par l'enseignant/e pour l'evaluation et la gestion de cheminement de l'eleve, comme outil de controle d'equipements de laroratoire. Informations sur le fonctionnement de diverses banques de donnees (I.B.M., ERIC, Telidon . . .). TEN-17541; 3 Credit Hours; ler cycle; 14 Weeks; Hiver.

INFOGRAPHIE ET ENSEIGNEMENT: Possibilities graphiques du IBM-PC. Caracteristiques des equipements et accessoires. Initiation aux commandes usuelles. Graphiques de faible et de haute resolution. Trace de courbes. Animation d'objets. Accompagnement sonore. Utilisation de logiciels interactifs a des fins pedagogiques. TEN-17542; 3 Credit Hours; ler cycle; 14 Weeks; Hiver.

TELIDON ET ENSEIGNEMENT. Historique et developpement des divers systemes videotex. Possibilities et limites de la telematique. Caracteristiques des equipements. Application de la technologie TELIDON a lenseignement. Exercises pratiques de conception, d'elaboration et d'exploitation de pages d'affichage. TEN-17543; 3 Credit Hours; ler cycle; 14 Weeks; Hiver.

ORDINATEUR ET ADMINISTRATION SCOLAIRE: Description sommaire du fonctionnement d'un ordinateur. Organigramme, ordinogramme et procedures. Systemes d'exploitation. Fichiers "ETUDIANTS": dossier social, admission et inscription, bulletin, diplome. Fichiers "COURS", fichier "PROGRAMMES" fichier "RESOURCES". Systeme integre de gestion. Production d'horaires. Prevision de couts par programme. Distribution des resources financieres, physiques et humaines. TEN-61255; 3 Credit Hours; 2 e et 3e cycles; 14 Weeks; Hiver.

ORDINATEUR ET ENSEIGNEMENT I: Introduction au monde de l'ordinateur et du micro-ordinateur et a son utilisation comme moyen d'enseignement apprentissage. 2-Notions d'informatique (3 semaines). 2-Etude de systemes pour des applications pedagogiques de l'ordinateur (APO) (4 semaines). 3-Developpement d'un didacticiel sur l'un des

systemes etudies (7 semaines). TEN-61510; 3 Credit Hours; 2 e et 3 e cycles; 14 Weeks; Automne.

ORDINATEUR ET ENSEIGNEMENT II: Suite de cours TEN-61510. Etude plus particuliere de l'utilisation de l'ordinateur en mode conversationnel dans le domaine de l'enseignement/apprentissage. Etude de techniques permettant de faciliter un dialogue homme-ordinateur. Simulation d'echanges mitre-eleve, informateur-banque de donnees, chercheur-banque f'information, professional-client et autres situations impliquant une interaction directe avec l'ordinateur. TEN-61511; 3 Credit Hours; 2 e et 3 e cycles; 14 Weeks; Hiver.

ORDINATEUR ET PLANIFICATION D'ENSEIGNEMENT: Etude des possibilities d'utilisation de l'ordinateur comme support a l'execution de diverses taches de la planification d'un cours. L'ordinateur comme outil pour la definition d'objectifs generaux et specifiques, la structuration de contenus pedagogiques, le choix de methodes et de medias d'enseignement, la construction de tests. Etude de l'apport de systemes pour le traitement de texte et pour la gestion de projets dans la planification d'un enseignement. Recherche en vue de la conception d'un systeme expert dusceptible d'assumer les taches mentionnees precedemment. Il s'agit d'un seminaire de recherche dans lequel la methode des projets est privilegiee. TEN-63488; 3 Credit Hours; 2e et 3e cycles; 14 Weeks; Hiver.

LANGAGES D'AUTEURS ET DIDACTICIELS: Caracteristiques des langages (machine, evolues, d'auteurs et naturels), etudes comparees de langages d'auteurs, application pedogogique d'un langage auteur. Caracteristiques des types de didacticiels (lecons et cours), modele semiologique d'analyse de didacticiels et application pedagogique d'un didacticiel. TEN-63489; 3 Credit Hours; 2e cycle et 3e cycle; 14 Weeks; Automne.

PROGRAMMATION STRUCTUREE DANS LES A.P.O.: Elements d'algorithmique. Notions de programmation structuree. La programmation structuree en BASIC. Initiation au langage Pascal. Developpement de didacticiels selon les principes de la programmation structuree. IFT-63515; 3 Credit Hours; 2e cycle et 3e cycls; 14 Weeks; Automne-Hiver.

UNIVERSITY OF MANITOBA

Inquiries: Dr. L. Sandals, Faculty of Education.
Univeristy of Manitoba, Winnipeg, Manitoba R3T 2N2.

COMPUTER APPLICATION TO EDUCATION I: Computers will be considered in the educational context as subjects of instruction, tools of instruction, research and development tools and management tools. 43.306; 3 Credits; Undergraduate/Graduate;

COMPUTER APPLICATION TO EDUCATION II: An advanced course dealing with tutorial applications of computers in both regular and special education classrooms. 43:526; 3 Credits; Graduate;

ADVANCED COMPUTER APPLICATION IN EDUCATIONAL PSYCHOLOGY: This course will deal with the use of recent innovations in computer-assisted learning technology and will be set up to take into account the needs of the graduate level student in the Faculty of Education. 43.716; 3 Credits; Graduate;

Inquiries: Dr. Harvey Williams, Faculty of Education.

MICROCOMPUTERS IN MATH AND SCIENCE: An introduction to the computer and programming for school mathematics and science; instructional methodology problem-solving, tutorial, and simulation modes of computer use in the classroom. 81.528; 6 Credits; Graduate; Spring, Fall, Summer.

Inquiries: Dr. Denis Hlynka, Faculty of Education.

RECENT DEVELOPMENTS: New information technologies. Theoretic study of new information media and environments. Technologies examined include video, tape, videodisc, videotex, satellite, microcomputers, and distance education technologies. 81.530; 3 Credits; Graduate; 12 Weeks;

Inquiries: Dr. Dennis King, Faculty of Education.

COMPUTER APPLICATIONS TO SOCIAL STUDIES AND GEOGRAPHY: 63.5XX; 3 Credits; Graduate; 12 Weeks; Spring, Fall, Summer.

MCGILL UNIVERSITY

Inquiries: Peter G. Burpee, Director, Certificate in Educational Technology, Faculty of Education, McGill University, 3700 McTavish St., Montreal, Quebec H3A 1Y2.

INTRODUCTION TO LOGO AND EDUCATIONAL COMPUTING: The microcomputer and its learning applications with children. Special attention is given to LOGO graphics, the development of lessons with an authorizing language and the use of the microcomputer for remedial work in subjects such as reading and mathematics. 432-240; 3 Credits; Undergraduate; 12 Weeks; Spring, Fall, Summer.

MICROCOMPUTERS IN EDUCATION: BASIC I: The microcomputer as an instructional and general purpose tool: beginning programming in BASIC (control statements, loops, subscripted variables, arrays, simple graphs); operational skills; criteria for evaluatilng instructional programs. 432-242; 3 Credits; Undergraduate; 12 Weeks; Spring, Fall, Summer.

MICROCOMPUTER APPLICATIONS IN THE EDUCATIONAL ENVIRONMENT: Types of instructional programs and their place in learning; teaching and managing school/CEGEP computer science; subject-based application, including remedial programs, teaching gifted children and children with learning disabilities; authoring languages; general applications such as word processing, record-keeping and test item banks; information systems and data banks. 432-344; 3 Credits; Undergraduate; 12 Weeks; Spring, Fall, Summer.

LOGO AND THE LEARNING PROCESS: A study of LOGO as a discovery computer language, its special contribution to the learning process, and its other educational applications. 432-311; 3 Credits; Undergraduate; 12 Weeks; Spring, Fall, Summer.

MICROCOMPUTERS IN EDUCATION: BASIC II: Continuation of BASIC programming; 2–D arrays, string manipulations, subroutines, using DOS, graphics, top-down

design, programming strategies, authoring languages; developing CAL exercises. Emphasis on programming for instructional purposes. 432-342; 3 Credits; Undergraduate; 12 Weeks; Spring, Fall, Summer.

INSTRUCTIONAL PROGRAMMING IN PASCAL: Overview of programming languages; design features of Pascal; operating systems and editors; control statements; data structure (arrays, records, sets, files); Pascal in the school curriculum. 432-244; 3 Credits; Undergraduate; 12 Weeks; Spring, Fall, Summer.

AUTHORING LANGUAGES: Microcomputer authoring languages, their characteristics, limitations and application. Lesson and test design, flow charting, use of graphics, sound, and data files; development, trials and revision of computer lessons prepared during the course. 432-346; 3 Credits; Undergraduate; 12 Weeks; Spring, Fall, Summer.

MICROCOMPUTER APPLICATIONS IN SECONDARY EDUCATION: The use of microcomputers in a selected area of secondary school teaching; examination and evaluation of software; development of programs for classroom use; and analysis of future implications for the curriculum. 425-391; 3 Credits; Undergraduate; 12 Weeks; Spring, Fall, Summer.

INSTRUCTIONAL SOFTWARE DESIGN AND EVALUATION:
The theory and design of computer-assisted learning modules; including determining specific learner needs and objectives, lesson flowcharting, lesson modes and design, feedback, evaluation and revision, teaching and managing microcomputer-based lessons. 432-348; 3 Credits; Undergraduate; 12 Weeks; Spring, Fall, Summer.

INDEPENDENT PROJECT: A major educational computing project (eg. development of educational software/documentation) undertaken by the student after consultation with the Direction of the Educational Technology program. 432-405; 6 Credits; Undergraduate; 12 Weeks; Spring, Fall, Summer.

MICROCOMPUTER GRAPHICS AND ANIMATION: A study of programming techniques for graphics and animation as applied to the development of educational software. Included are graphing, tokens/shape tables, utility programs, animation and sound. 432-442; 3 Credits; Undergraduate; 12 Weeks; Spring, Fall, Summer.

MEMORIAL UNIVERSITY OF NEWFOUNDLAND

Inquiries: Dr. Richard T. Braffet, Acting Director, Division of Learning Resources, Faculty of Education, Memorial University of Newfoundland, St. John's Newfoundland A1C 5S7.

MICROCOMPUTERS IN EDUCATION: Computer assisted instruction applications. L6480; 3 Credit Hours; Graduate; 13 Weeks, Fall, Winter; 6 Weeks Summer;

UNIVERSITY OF NEW BRUNSWICK

Inquiries: Dr. M. Small, Chairman, Division of Curriculum and Instruction, University of New Brunswick, Fredericton, New Brunswick E3B 6E3.

MICROCOMPUTER PROGRAMMING FOR TEACHERS: Introductory programming, Basic and Logo. EDCI 2416, 3 Credit Hours; Undergraduate; 6 Weeks; Summer.

USING COMPUTERS IN TEACHING THE ACADEMIC SUBJECTS: Computer as curriculum enhancer, Elementary subjects, Secondary Academic Areas, — some programming — Logo, Pascal. EDCI 4426; 3 Credit Hours; Undergraduate; 13 Weeks, Spring; 6 Weeks, Summer.

MICROCOMPUTERS IN THE BUSINESS EDUCATION CLASSROOM: Provides the secondary school teacher with hands-on experience in the use of the microcomputer for the teaching of word processing, data processing and accounting as well as the use of current business software. EDVO 3887; Credit; Undergraduate; 12 Weeks; Fall, Spring.

Inquiries: Prof. Gerald L. Roussie, Division of Vocational Education, Faculty of Education.

BUSINESS DATA PROCESSING: Data processing, data base, spreadsheets, integrated software. EDVO 2887; 3 Credit Hours; Undergraduate; 13 Weeks; Spring, Fall.

WORD PROCESSING APPLICATIONS: Word processing, automated typing systems. EDVO 4817; 3 Credit Hours; Undergraduate; 13 Weeks, Fall; 3 Weeks, Summer.

WORD PROCESSING MANAGEMENT: Management, work measurement, word processing, systems and equipment. EDVO 4867; 3 Credit Hours; Undergraduate; 13 Weeks; Fall.

MICROCOMPUTERS IN THE BUSINESS CLASSROOM: Word processing, data base, spreadsheets, methodology, automated accounting, computer education. EDVO 3887; 3 Credit Hours; Undergraduate; 13 Weeks; Fall, Summer.

NOVA SCOTIA AGRICULTURAL COLLEGE

Inquiries: S. G. Smith, Department of Mathematics and Physics, Nova Scotia Agricultural College, P.O. Box 55, Truro, Nova Scotia B2N 5E3.

COMPUTATIONAL METHODS: Microcomputer use in decision-making and management. Agricultural applications are stressed. The basics of programming are stressed through laboratory exercises. MP 14; 2-year Agricultural Technician Program; 13 Weeks; Spring.

NOVA SCOTIA TEACHERS' COLLEGE

Inquiries: Dr. D. L. Burt, P.O. Box 810, Nova Scotia Teachers' College, Truro, Nova Scotia B2N 5G5.

COMPUTERS IN EDUCATION: The primary emphasis of this course will be on developing the skills and concepts

necessary for the classroom teacher to incorporate computer-assisted learning into his/her program of instruction. CIN 323; 3 Credit Hours; Undergraduate; 12 Weeks; Spring/Fall, 3 Weeks Summer.

EVALUATION AND DESIGN OF COMPUTER SOFTWARE FOR THE CLASSROOM: This course is intended to provide teachers with the fundamental knowledge and practice needed to decide when to adopt prepared software, modify existing software, and create software to meet the need of learners. CIN 333; Credit; Undergraduate; 13 Weeks Spring/Fall, 3 Weeks Summer.

COMPUTER LITERACY: A course designed to serve teachers by establishing basic skills and providing background knowledge to establish a basic level of computer literacy. COM 203; Credit; Undergraduate; 13 Weeks Spring/Fall, 3 Weeks Summer.

THE ONTARIO INSTITUE FOR STUDIES IN EDUCATION

Inquiries: Dr. Donald F. Burrill, Dept. of Measurement, Evaluation, & Computer Application, The Ont. Inst. for Studies in Educ., 252 Bloor Street West, Toronto, Ontario M5S 1V6.

COMPUTERS AND INDIVIDUALIZED INSTRUCTION: Individualized instruction, learning theory, instructional design. 1500; 3 Credit Hours; Graduate; 13 Weeks; Spring, Fall, Summer.

COMPUTER-GUIDED INSTRUCTION: Computer-assisted instruction, computer-assisted learning, computer-managed learning, authoring languages, authoring systems, evaluation of CAI, courseware production, CAI systems. 1501; 3 Credit Hours; Graduate; 13 Weeks; Spring, Fall, Summer.

INTRODUCTION TO COMPUTER APPLICATIONS IN EDUCATION: Computers in the classroom, educational software, computer assisted instruction, computer tools programming for children, administrative applications. 1503; 3 Credit Hours; Graduate; 13 Weeks; Spring, Fall, Summer.

INSTRUCTIONAL PROGRAMMING: Instructional design, programming, evaluation. 1505; 3 Credit Hours; Graduate; 13 Weeks; Spring, Fall, Summer.

PREREQUISITE SKILLS IN COMPUTER APPLICATIONS: Word processing, programming, spreadsheets. 1506; Non-credit; Graduate; 13 Weeks; Spring, Fall, Summer.

EDUCATIONAL TECHNOLOGY AND PRODUCTION DESIGN. Interactive video, computer animation, video production, videodisc, instructional design, computer-assisted learning. 1509; 3 Credit Hours; Graduate; 13 Weeks; Spring, Fall, Summer.

COMPUTER-ASSISTED LANGUAGE INSTRUCTION: LEVEL I: Word processing, computer-aided instruction/learning, tutorial, instructional programming, mother tongue, first language, second language, foreign language. 1511; 3 Credit Hours; Graduate; 13 Weeks; Spring, Fall, Summer.

COMPUTERS IN THE CURRICULUM: Computers in the classroom, computer tools word processors, data base applications, creative uses, computer art, music systems, computers in Math and Science, simulations, games. 1515; 3 Credit Hours; Graduate; 13 Weeks; Spring, Fall, Summer.

PROGRAMMING APPLICATIONS IN ONTARIO CURRICULA: Programming, computer literacy, structured programming, software science, software psychology. 1516; 3 Credit Hours; Graduate; 13 Weeks; Spring, Fall, Summer.

PERSONAL COMPUTING AND EDUCATION: Microcomputers, hardware, software, peripheral devices. 1517; 3 Credit Hours; Graduate; 13 Weeks; Spring, Fall, Summer.

PROCESSING EDUCATIONAL RESEARCH DATA: Statistics, data analysis. 1520 3 Credit Hours; Graduate; 13 Weeks; Spring, Fall, Summer.

THE COMPUTER IN EDUCATIONAL ADMINISTRATION: Office automation in school office, academic management, microcomputers and administrative software, provincial management information systems, computer systems configurations. 1525; 3 Credit Hours; Graduate; 13 Weeks; Spring, Fall, Summer.

RESEARCH SEMINAR IN INTERACTIVE SYSTEMS FOR EDUCATION: User interface, system design, interactive systems, tools. 3500; 3 Credit Hours; Graduate; 13 Weeks; Spring, Fall, Summer.

DECISION SUPPORT SYSTEMS IN EDUCATION: Decision typologies, user-interface systems, distributed decision-making, information centres, expert systems, implementation, school boards and computer support systems. 3501; 3 Credit Hours; Graduate; 13 Weeks; Spring, Fall, Summer.

EDUCATIONAL TECHNOLOGY: INTERACTIVE VIDEO AND GRAPHICS: Interactive video, computer graphics computer animation, video production, videodisc, instructional design, computer assisted learning, cognition, instructional design theories, human information processing, motivation, perception. 3503; 3 Credit Hours; Graduate; 13 Weeks; Spring, Fall, Summer.

COMPUTER-ASSISTED LANGUAGE INSTRUCTION: LEVEL II: Word processing, computer-aided instruction/learning, tutorial, instructional programming, mother tongue, first language, second language, foreign language. 3511; 3 Credit Hours; Graduate, 13 Weeks; Spring, Fall, Summer.

INTELLIGENT COMPUTER SYSTEMS IN INSTRUCTION AND LEARNING: Artificial Intelligence, expert systems, intelligent tutoring systems, computer coaches, innovative computer-based learning environments, sophisticated programming environments. 3512; 3 Credit Hours; Graduate; 13 Weeks; Spring, Fall, Summer.

EVALUATION AND MICROCOMPUTER-BASED CURRICULUM MATERIALS: Courseware evaluation, instructional design, evaluation methodologies. 3517; 3 Credit Hours; Graduate; 13 Weeks; Spring, Fall, Summer.

SIMULATION MODELS OF COGNITION AND LEARNING: Information processing, cognitive processes, computer models, computers and learning. 3535; 3 Credit Hours; Graduate; 13 Weeks; Spring, Fall, Summer.

RESEARCH SEMINAR ON INFORMATION PROCESSING IN EDUCATION: Special topic: computerized experimentation, individualization, time-sharing, social implications, etc. 3556; 3 Credit Hours; Graduate; 13 Weeks; Spring, Fall, Summer.

UNIVERSITY OF OTTAWA

Inquiries: The Dean, Faculty of Education, University of Ottawa, 651 Cumberland, Ottawa, Ontario K1N 6N5.

ORDINATEURS EN EDUCATION: Historique des ordinateurs depuis leur début; générations actuelles et futures d'ordinateurs; impact sur l'apprentissage en milieu scolaire; matériel, logiciel et didacticiel; terminologie de l'ordinatique. PED 1794; 3 Credits; Undergraduate; Spring, Fall, Summer.

APPLICATION DES ORDINATEURS EN EDUCATION: Utilisation des ordinateurs en éducation; impact sociologique; puissance et limite des ordinateurs; dépendance de l'intelligence humaine; étude de logiciel et de didacticiel; mises en situation. PED 1894; 6 Credits; Undergraduate; Spring, Fall, Summer.

PRINCIPES DE DESIGN DE LOGICIELS: Bases psychopédagogiques du design de logiciels et de didacticiels; évaluation de logiciels et de didacticiels. PED 2794; 3 Credits; Undergraduate; Spring, Fall, Summer.

APPLICATION DES THEORIES D'ENSEIGNMENT ASSISTE PAR ORDINATEURS: Mise en application des théories psychopédagogiques de l'apprentissage par ordinateurs (e.g. "C.A.I.", "C.M.I.", "C.M.L.", etc.); évaluation de certains systèmes; mises en situation. PED 2894; 6 Credits; Undergraduate; Spring, Fall, Summer.

RECHERCHES ET TENDANCES ACTUELLES DE L'ORDINATIQUE EN EDUCATION: Etude des différents courants de pensée en ordinatique; tendances locales, provinciales et nationales. PED 3794; 3 Credits; Undergraduate; Spring, Fall, Summer.

PLANIFICATION ET SUPERVISION DE PROGRAMMES INTEGRANT L'ORDINATEUR: Role du coordonnateur, du supérieur, du spécialiste et du consultant; aspects administratifs; utilisation d'un langage d'auteur; ressources; mises en situation. PED 3894; 6 Credits; Undergraduate; Spring, Fall, Summer.

INFORMATIQUE AU CYCLE INTERMEDIARE: Ce cours vise a initier l'enseignant a l'enseignement de l'informatique au cycle intermédiaire selon les stades de développement de l'élève. Carrières en informatique. Câdre théorique de l'apprentissage de l'informatique, implications pédagogiques. PED 1755; 3 Credits; Undergraduate; Spring, Fall, Summer.

INFORMATIQUE AU CYCLE SUPERIEUR: Ce cours vise à familiariser l'enseignant avec les principes et procédés d'enseignement dans les matières connexes à l'informatique. PED 1756; 3 Credits; Undergraduate; Spring, Fall, Summer.

THE LEARNER AND THE COMPUTER: A brief history of computers within the learning environment; an examination of the elements in computer assisted learning; knowledge and skills necessary to assist and instruct the learner in the use of computers. PED 1390; 3 Credits; Undergraduate; Spring, Fall, Summer.

APPLICATION OF THE COMPUTERS IN THE CLASSROOM:
An examination and use of hardware and software as applied to the classroom; classroom utilization of computers; software documentation; software evaluation; the role of the computer in supporting the classroom programmes; design and organization to meet user needs; hands-on experience. PED 1490; 6 Credits; Undergraduate; Spring, Fall, Summer.

THE ROLE OF COMPUTERS IN THE TEACHING-LEARNING PROCESS: The computer in the teaching-learning process; potential and limitations; characteristics of computers and implications in the instructional process; information technology and its impact. PED 2390; 3 Credits; Undergraduate; Spring, Fall, Summer.

THE COMPUTER AND THE CURRICULUM: An examination of the ways in which computers can assist discipline areas and learner exceptionalities; computer-based instruction (e.g. C.A.I., C.M.I., C.M.L. etc.); development of software to suit needs of the learner; use of computers for information retrieval; hands-on experience. PED 2490; 6 Credits; Undergraduate; Spring, Fall, Summer.

SUPERVISION AND MANAGEMENT OF COMPUTER-BASED EDUCATION: An appraisal of the role of the administrator and consultant in a computer-based learning programme; leadership styles; basic principles of administration as applied to in-service programmes; development of an effective in-service programme for teachers; techniques for evaluation of programmes. PED 3390; 3 Credits; Undergraduate; Spring, Fall, Summer.

COMPUTERS IN THE SCHOOL SYSTEM: A comparative study of current issues and implications of computer-based learning across the grades in a school system; comparison of different computer utilization programmes; exploration of an authoring language; resources for computer assisted learning; hands-on experience. PED 3490; 6 Credits; Undergraduate; Spring, Fall, Summer.

ORDINATIQUE AU CYCLE INTERMEDIAIRE:
Ce cours de didactique vise à initier l'étudiant-maître à l'enseignement de la discipline au cycle intermédiare selon les stades de croissance et de développement de l'élève. Contribution de la matière à ce stade de développement, câdre théorique de l'apprentissage de cette discipline et implications pédagogiques; étude critique et interpretation des exigences des programmes-câdres. PED 3727; 3 Credits; Undergraduate; Spring, Fall, Summer.

ORDINATIQUE AU CYCLE SUPERIEUR: Ce cours de didactique vise a initier l'étudiant-maître à l'enseignement de la discipline au cycle supérieur selon les stades de croissance et de développement de l'élève. Contribution de la matière à ce stade de développement, câdre théorique de l'apprentissage de cette discipline et implications pedagogiques; étude critique et interprétation des exigences des programmes-câdres. PED 3727; 3 Credits; Undergraduate; Spring, Fall, Summer.

TEACHING COMPUTER SCIENCE AT THE INTERMEDIATE DIVISION: Introduction to the teaching of the discipline at the intermediate division. Impact of the discipline on the whole learner; individualizing instruction; theoretical framework and pedagogical implications; critical examination and interpretation of relevant curriculum guidelines. PED 3174; 3 Credits; Undergraduate; Spring, Fall, Summer.

TEACHING COMPUTER SCIENCE AT THE SENIOR DIVISION: Introduction to the teaching of the discipline at the senior division. Impact of the discipline on the whole learner; individualizing instruction; theoretical framework and pedigogical implications; critical examination and interpretation of relevant curriculum guidelines. PED 4174; 3 Credits; Undergraduate; Spring, Fall, Summer.

APPRENTISSAGE ASSISTE PAR ORDINATEUR: Modèles de conceptualisation, d'implémentation et d'évaluation en apprentissage assisté par ordinateur. Stratégies et techniques de conceptualisation, de rédaction et d'édition de didacticiel sur les micro-ordinateurs à l'aide d'un langage d'auteur. EDU 5597; 3 Credits; Graduate; Spring, Fall, Summer.

LOGO ET APPRENTISSAGE: Modéles de curriculum axés sur le LOGO. Stratégies d'enseignement. Contribution de la recherche à la conceptualisation et à la réalisation de modules d'enseignement. Intégration du langage LOGO dans les paradigmes d'apprentissage. EDU 6597; 3 Credits; Graduate; Spring, Fall, Summer.

LA SIMULATION EDUCATIONNELLE: Conceptualisation, opérationalisation, implémentation et évaluation de simulations éducationelles sur micro-ordinateur. Intégration des simulations éducationnelles dans diverses stratégies d'enseignement. Interaction entre simulations, styles et stratégies d'apprentissage. EDU 7597; 3 Credits; Graduate; Spring, Fall, Summer.

COMPUTER-AIDED LEARNING: Design, implementation, and evaluation models in Computer-Aided Learning (CAL). Procedures for creating and editing courseware. Strategies and techniques in courseware authoring on micro-computers. EDU 5197; 3 Credits; Graduate; Spring, Fall, Summer.

LEARNING WITH LOGO: Alternative models of curriculum based on LOGO. Alternative strategies of instruction. Contribution of research to the design and development of instructional systems. Integration of LOGO into learning paradigms. EDU 6197; 3 Credits; Graduate; Spring, Fall, Summer.

EDUCATIONAL SIMULATION: Design, operationalization, implementation and evaluation of models for educational simulation on micro-computers. Integration of educational simulations into alternative strategies of instruction. Interaction between simulations, learning styles and learning strategies. EDU 7197; 3 Credit; Graduate; Spring, Fall, Summer.

UNIVERSITE DU QUEBEC A TROIS-RIVIERES

Inquiries: Mr. J-Claude Lainesse, Directeur, Department des sciences de l'education. Universite du Quebec a Trois-Rivieres, C.P. 500, Trois-Rivieres, Quebec G9A 5H7.

ETUDE COMPARATIVE DES LANGAGES D'AUTEUR (TLE-1012): Authoring Language and Microcomputer. PRO-1017; 3 Credits; Undergraduate; 15 Weeks; Spring, Fall.

LE MICRO-ORDINATEUR ET L'ENSEIGNEMENT: Computer literacy. TLE -1012; 3 Credits; Undergraduate; 15 Weeks; Spring, Fall.

DESIGN PEDAGOGIQUE ET ENSEIGNEMENT ASSISTE PAR ORDINATEUR (TLE-1012): Instructional design and microcomputer. TLE-1013; 3 Credits; Undergraduate; 15 Weeks; Spring, Fall.

METHODES D'ANALYSE POUR LA CONCEPTION DE DIDACTICIELS (TLE-1013): Programming. TLE-1014; 3 Credits; Undergraduate; 15 Weeks; Spring, Fall.

PROGAMMATION STRUCTUREE: Programming. PRO-1014; 3 Credits; undergraduate; 15 Weeks; Spring, Fall.

LANGAGES EDUCATIQUES (TLE-1013): Programming — Logo. PRO-1018; 3 Credits; Undergraduate; 15 Weeks; Spring, Fall.

LANGAGES ET SYSTEMES D'AUTEUR (PRO-1017); TLE-1013): Authoring system. PRO-1019; 3 Credits; Undergraduate; 15 Weeks; Spring, Fall.

JEUX ET SIMULATION (TLE-1013): Play and simulation and microcomputer. TLE-1016; 3 Credits; Undergraduate; 15 Weeks; Spring, Fall.

ORDINATEUR, ECOLE ET SOCIETE (TLE-1012): Social changes and microcomputer. TLE-1018; 3 Credits; Undergraduate; 15 Weeks; Spring, Fall.

EVALUATION ET GESTION INFORMATIQUE DES APPRENTISSAGES (TLE-1012): Evaluation and microcomputer. TLE-1020; 3 Credits; Undergraduate; 15 Weeks; Spring, Fall.

QUEEN'S UNIVERSITY (A)

Inquiries: Dr. Hugh Munby, Director of Graduate Studies, Faculty of Education, Duncan McArthur Hall, Queen's University, Kingston, Ontario K7L 3N6.

COMPUTERS IN EDUCATION: An introductory, laboratory-oriented course reviewing recent developments in hardware and software. Topics include introductory programming (for instruction) and reviews of computer-based curriculum materials. EDUC 885; Credit; Graduate; 5 Weeks Summer; 12 Weeks Fall, Winter.

COMPUTER-BASED SIMULATION: An introduction to generic modelling concerns with a systems-dynamic feedback approach, and a review of instructional packages on simulation. Production of computer-based models for classroom use. EDUC 886; Credit; Graduate; 5 Weeks Summer; 12 Weeks Fall, Winter.

CREATIVE USES OF MICRO-COMPUTERS: Developments in microcomputer software having strong potential for open-ended learner exploration. Logo (mathematics and computing science), word-processing (creative writing), "paint" packages (graphic composition), and music editors (composition). EDUC 887; Credit; Graduate; 5 Weeks Summer; 12 Weeks Fall, Winter.

QUEEN'S UNIVERSITY (B)

Inquiries: Mr. Peter Baxter, Department of Film Studies, Queen's University, Kingston, Ontario K7L 3N6.

CULTURE AND TECHNOLOGY: Analyse relation of technology to culture generally with special emphasis on new information technologies. FILM 335; Credit; Undergraduate; 12 Weeks; Fall.

UNIVERSITY OF REGINA

Inquiries: Dr. David Bale, Assistant Dean, Faculty of Education, University of Regina, Regina, Sask. S4S 0A2.

COMPUTER APPLICATIONS IN EDUCATION: Literacy — includes word processing, spreadsheet introduction and some programming. ECMP 362; 4 Credit Hours; Undergraduate; 13 Weeks, Fall, Winter; 3½ Weeks, Summer.

CURRICULUM AND INSTRUCTION IN COMPUTER SCIENCE: Teaching Computer Science/Curriculum and Instruction/Methods (includes all Secondary school computer applications and programming). ECMP 368; 4 Credit Hours; Undergraduate; 13 Weeks; Fall; 3 Weeks, Summer.

C.A.I.: Computer assisted instruction/learning. ECMP 493/890; 4 Credit Hours; Undergraduate/graduate; Occasional.

UNIVERSITE SAINTE-ANNE

Inquiries: Charles Gaudet, Director, Ecole professionnelle et de metiers, Universite Sainte-Anne, Church Point, Nova Scotia B0W 1M0.

NOUVELLES TECHNOLOGIES EN EDUCATION: PED 2133; 3 Credits; Undergraduate; 15 Weeks; Spring.

UNIVERSITY OF SASKATCHEWAN

Inquiries: Dr. F. B. Brown, Head, Department of Communications, Continuing and Vocational Education, College of Education, University of Saskatchewan, Saskatoon, Saskatchewan S7N 0W0.

INTRODUCTION TO COMPUTERS IN EDUCATON: Overview of the role of computers in society and in education — both present and future. Introducing facility with BASIC will be developed through the use of program modification and simple programming techniques. Current levels in hardware and software development will be discussed. CMPED 218.3; 3 Credits; Undergraduate; 14 Weeks; Spring, Fall, Summer.

APPLYING COMPUTATIONAL TECHNOLOGY IN EDUCATION: Advanced control structures (various loops, subprocedures, etc.), advanced data structures (strings, arrays, files, etc.), and various applications will be presented. CMPED 418.3; 3 Credits; Undergraduate; 14 Weeks; Spring, Fall, Summer.

METHODS OF TEACHING COMPUTER SCIENCE IN THE SECONDARY SCHOOL: This course will prepare secondary teachers to teach computer science in the secondary schools of the province. Topics will include an examination of current curricula, methodologies, and hardware currently used in the schools. The development of problem solving skills needed for success in computer programming will be included. EDCUR 319.3; 3 Credits; Undergraduate; 14 Weeks; Spring, Fall, Summer.

A SURVEY OF MICROCOMPUTER APPLICATIONS IN EDUCATIONAL ENVIRONMENTS: This course will present a variety of applications of existing software for information manipulation and management for classroom teachers and administrators. Topics will include hardware requirements, text management, telecommunications, data base management, simulation and model building, and graphics. EDCCV 370. 3; 3 Credits, Undergraduate; 14 Weeks; Spring, Fall, Summer.

UNIVERSITE DE SHERBROOKE

Inquiries: Guy Stringer, Secretaire, Faculte d'Education, Universite de Sherbrooke, Sherbrooke, Quebec J1K 2R1.

INFORMATIQUE L'ORDINATEUR ET L'ENSEIGNEMENT: Ce cours a pour but, non pas de former des spécialistes de l'informatique, mais de permettre à des éducateurs de décider s'ils utiliseront ou non l'ordinateur comme instrument pédagogiqué. DCS 503; 3 Credits; Undergraduate; 15 Weeks; Spring, Fall, .

ELEMENTS DE LOGICIEL: A la suite de ce cours, l'étudiant devraît maitriser les principales techniques et outils de programmation (programmation structurée, ordinagramme, boucles, tableaux, fichiers, graphisme, couleur et son) et avoir conçu et réalisé un ligiciel (ou didacticiel) qui répond à un besoin dans son milieu de travail. Il s'agit donc d'un cours/atelier qui se déroulera principalement au laboratoire de micro-informatique. TEC 102; 3 Credits; Undergraduate; 15 Weeks; Fall.

DIDAXOLOGIE A LA SCIENCE DE L'INFORMATIQUE AU SECONDAIRE: Ce cours vise a habiliter l'etudiant-maître face à l'enseignement du programme d'introduction a la Science de l'informatique (ISI). Aperçu des théories cognitives sous-jacentes à l'utilisationl'ordinateur a l'école et conception de l'activite de programmation comme génératrice d'habiletés de résolution de probleme. TEC 106; 3 Credits; Undergraduate; 15 Weeks; Winter

SYSTEMES D'INFORMATION: Ce cours vise à faire acquérir les connaissances et habiletés relatives aux principaux aspects de l'informatique en milieu scolaire: la pédagogie, la gestion, la quincaillerie et la programmation — connaissances et habiletés jugées utiles a ceux qui ont la responsabilité d'administrer cette ressource. SIG 800; 3 Credits; Graduate; 15 Weeks; Winter

ORDINATEUR COMME OUTIL DIDACTIQUE AU PRIMAIRE: Familiarisation avec l'ordinateur à travers de situations d'apprentissage utilisant le langage LOGO.

Construction d'algorithmes de programmation. Heuristiques de résolutions de problèmes par le langage dans une pédagogie cognitive. ORP 300; 3 Credits; Undergraduate; 15 Weeks; Fall, Winter.

INFORMATIQUE ET DIDACTIQUE DE MATIERES: Etude de thèmes choisis dans le contexte de l'apprentissage et de l'enseignement par les moyens de l'informatique; exemples: enseignement assisté par l'ordinateur; étude, classification et critique de logiciels (didacticiels); apprentissage et langage de programmation; résolution de problemes à l'aide de l'ordinateur, réalisation de situations d'apprentissage à l'aide de ou sur l'ordinateur; etc. DPR 701; 3 Credits; Graduate; 15 Weeks; Winter.

INSTRUMENTATION PEDAGOGIQUE: S'appuyant sur les théories et les pratiques appartenant au domaine de la technologie de l'éducation, ce cours étudie les composantes impliquées dans la création et l'utilisation de produits éducatifs. C'est ainsi que seront mis en relation, d'une part, des apprentissages visés et, d'autre part, les techniques pour les réaliser. PED 403; 3 Credits; Undergraduate; 15 Weeks; Fall, Winter.

MICROPROCESSEURS I: Ce premier cours sur les microprocesseurs suppose une culture élémentaire en électronique des circuits integres, des circuits numériques et en mathematiques. Ce cours a pour intention de donner des connaissances de base et pratiques à ceux qui oeuvrent dans différents champs technologiques, afin d'entrer dans le domaine de la maintenance des produits et systèmes utilisant les microprocesseurs. PPS 525; 3 Credits; Undergraduate; 15 Weeks; Fall,.

MICROPROCESSEURS II: Il a pour intention de donner des connaissances et des pratiques à ceux qui oeuvrent dans différents champs technologiques, afin d'entrer dans le domaine de la maintenance des produits et systèmes utilisant les microprocesseurs. En particulier, les activités d'apprentissage seront faites en utilisant le microprocesseur 6800 de Motorola, en insistant sur l'interface parallele ou P/A pour réaliser un systeme de controle numérique simple. PPS 526; 3 Credits; Undergraduate; 15 Weeks; Winter.

SIMON FRASER UNIVERSITY

Inquiries: Dr. A. J. Dawson, Faculty of Education, Simon Fraser University, Burnaby, B.C. V5A 1S6.

COMPUTER-BASED LEARNING: CAI: drill and practice, tutors systems, simulations, authoring languages, research on CAI. EDUC 851-5; 5 Credit Hours; Graduate; 13 Weeks; Summer.

MICROCOMPUTERS IN EDUCATION: Word processing, programming — Logo, data bases, spreadsheets, educational software: tutors and simulations. EDUC 486-4; 4 Credit Hours; Undergraduate; 13 Weeks; Spring, Fall, Summer.

EDUCATIONAL USES OF COMPUTERS: Computer literacy, applications of computers in traditional subject areas, CAI, CMI, computers in educational administration. CMPT 362-4; 4 Credit Hours; Undergraduate; 13 Weeks; Spring, Summer.

MICROWORLDS AND THE WORLD OF LOGO: The course is designed for prospective and practising teachers who have had some experience with microcomputers. The course will function as a professional seminar. Each participant is expected to contribute to the education by means of discussions, presentations, sharing of experiences, reading, study, reflection, experimentation, etc.; EDUC 807; Undergraduate/Graduate.

INTRODUCTION TO LOGO: SPECIAL TOPICS: Microworlds and the World of Logo; Logo as a culture; Logo as a language. EDUC 489-4; 4 Credit Hours; Undergraduate; 13 Weeks; Fall.

COMPUTING SCIENCE EDUCATION I: Expert tutoring systems; applications to education. CMPT 601-5; 5 Credit Hours; Graduate; 13 Weeks; Spring.

COMPUTING SCIENCE EDUCATION II: Computer hardware, CPU architecture, microprocessors, virtual memory, LISP/PROLOG, vision, natural language, computer graphics. CPMT 602-5; 5 Credit Hours; Graduate; 13 Weeks; Spring.

SELECTED TOPICS IN EDUCATIONAL TECHNOLOGY: Teaching and learning with computers; artificial intelligence in education; list processing/LOGO. EDUC 804-5; 5 Credit Hours; Graduate; 13 Weeks; Fall.

UNIVERSITY OF WATERLOO

Inquiries: Dr. Ross Newkirk, Associate Dean, Computing and Communications, Faculty of Environmental Studies, University of Waterloo, Waterloo, Ontario N2L 3G1.

ENVIRONMENTAL METHODS AND TECHNIQUES I: Word processing, spreadsheets. M ENV 150; 0.5 Credits; Undergraduate; 12 Weeks; Fall.

COMPUTER PROGRAMMING IN ENVIRONMENTAL STUDIES: Pascal programming. ENV S 272; 0.5 Credits; Undergraduate; 12 Weeks; Winter.

ECONOMIC AND SOCIAL TECHNIQUES FOR REGIONAL PLANNING: Spreadsheets. Plan/Geog 319; 0.5 Credits; Undergraduate; 12 Weeks; Fall.

INTRODUCTION TO QUANTITATIVE RESEARCH METHODS: Spreadsheets, ENV S 271; 0.5 Credits, Undergraduate; 12 Weeks; Fall, Winter.

ENVIRONMENTAL RESEARCH SKILLS: Word processing, spreadsheets. M ENV 151; 0.5 Credits, Undergraduate; 12 Weeks; Winter.

UNIVERSITY OF WESTERN ONTARIO

Inquiries: Prof. John E. Walsh, Business & Computer Studies Department, Faculty of Education, University of Western Ontario, 1137 Western Road, London, Ontario N6G 1G7.

DATA PROCESSING: This course is designed to prepare teachers for the intermediate and senior divisions to teach data processing courses outlined in the Ontario Ministry of Education guideline, Computer Studies. The major emphasis of the course is on the methodology for the intermediate division course called Introduction to Computer Studies. BC E31; Pre-Service Credit; 125 Hours; Fall, Winter.

DATA PROCESSING, PART I: This course is to prepare teachers for the intermediate division to teach the Introduction to Computer Studies course as outlined in the Ontario Ministry of Education guideline, Computer Studies. The topics in the course include programming; computer applications, past-present-and future; structure of the computer; and careers in the computer field. This course examines both the topics and methodology for the advanced, general and basic level students. BC E31; In-Service Credit; 125 Hours; Summer.

DATA PROCESSING, PART II: This course is to prepare teachers for the senior division to teach data processing courses as outlined in the Ontario Ministry of Education guideline, Computer Studies. These courses include Data Processing Concepts, Data Processing Applications, Data Processing Techniques, and Data Processing Systems Analysis & Design. The course examines the content and methodology for each of the courses listed. BC E35; In-Service Credit; 125 Hours; Summer.

DATA PROCESSING, SPECIALIST: The specialist course examines and reviews all the Data Processing courses listed in the Ontario Ministry of Education guideline, Computer Studies. This course not only reviews the methodology and content for teaching the Data Processing course, but also examines other Ministry of Education guidelines which complement the Computer Studies guidelines. The course also examines the duties and functions of a Business Education Director in an Ontario Secondary School, considerations in selecting equipment and budgeting. BC E41; In-Service Credit; 125 Hours; Summer.

COMPUTERS IN THE CLASSROOM, PART I: This course is the first session of a three-part course dealing with the computers as they may be used across the curriculum for both the elementary and secondary school programs. Topics include the structure and function of computers, how to communicate with computers, evaluation of software, courseware, and lessonware. Introduction of the LOGO language and the developments of storyboards for Computer Assisted Instruction. BC E20; In-Service Credit; 125 Hours; Summer.

COMPUTERS IN THE CLASSROOM, PART II: Topics for this course include the use of pre-written software such as word processing, spreadsheets, and data-based management programs, the impact of the computer in society and particularly in education, more in-depth study of LOGO-like language, storyboarding and evaluating exemplary software. BC E21; In-Service Credit; 125 Hours; Summer.

COMPUTERS IN THE CLASSROOM, SPECIALIST: The topics include integrating computers into the curriculum, uses of software and hardware in various curricula especially for exceptional children, the duties and responsibilities of a computer co-ordinator, examination and evaluation of computer hardware and software. BC E22; In-Service Credit; 125 Hours; Summer.

COMPUTERS IN EDUCATION: Topics include a brief description of the structure of computers, methods of communicating with the computer (elementary programming), examples of pre-written software such as word processing and visicalc, methods of evaluating pre-written software, and a brief discussion of the impact of the computer on education. BC E61a/b; Pre-Service Credit; 80 Hours; Fall, Winter.

COMPUTER SCIENCE: This course is to prepare teachers for the intermediate and senior divisions to teach Computer Science courses as outlined in the Ontario Ministry of Education guideline, Computer Studies. The major emphasis of the course is on the methodology for the intermediate division course called Introduction to Computer Studies. Time is also devoted to examining the methodology of teaching the advanced level senior division courses of Computer Science & Technology. BC E38, Section A; Pre-Service Credit; 80 Hours; Fall, Winter.

HONOUR SPECIALIST COMPUTER SCIENCE: Instructional theory and skills for Computer Studies including the acquisition and evaluation of computer hardware, and the study of the related subject guidelines. A study of the current research in computers and the teaching methodology applicable to this subject area will be included. BC E 47; 4 Credit Hours; 4 Weeks; Summer.

UNIVERSITY OF WINDSOR

Inquiries: Dr. J.C. Powell, Faculty of Education, 600 Third Concession Road, University of Windsor, Windsor, Ontario N9E 1A5.

COMPUTER AWARENESS: Exposure is the key description. 81-300, Section S; Pre-Service Credit; 20 Weeks; Spring.

COMPUTERS IN THE CLASSROOM (PART I): The key description is literacy including W/P, S/S, BASIC, not including Files. 83-151/152; Post-Graduate, B.Ed. Level; 20 Weeks; Fall, Winter, Spring.

COMPUTERS IN THE CLASSROOM (PART II): The key description is advanced applicants including File management. 83-251/252; Post-Graduate, B.Ed. Level; 20 Weeks; Fall, Winter, Spring.

Inquiries: Dr. Wilfred Innerd, Faculty of Education.

COMPUTERS IN THE CLASSROOM, PART I: An introduction to computers in elementary and secondary schools. The history, uses, capabilities, limitations and components of various computer and microcomputer systems. Implications for education. Integrating computers into the curriculum. Selection, evaluation and utilization of computer learning materials. Exemplary software. Basic knowledge skills for operation of microcomputers. Introduction to programming (BASIC). Instructional uses for the computer including computation aid, information retrieval, drill and practice, tutorials, "number crunching", simulations, decision-making, testing, problem-solving, individualization, grading investigating and laboratory instrumention. Educational games as motivators, simulators of reality, and styles of interaction. Introduction to word processing, computer graphics, computer music, computer managed instruction and computer-assisted learning. 81-151/152; 6 Credit Hours; Undergraduate; Fall, Winter.

COMPUTERS IN THE CLASSROOM, PART II: Word processing as a creative writing tool and other classroom applications; data management and its applications in elementary and secondary schools; computer communications, including networking and Telidon; information storage and retrieval, including main frame and commercial data bases. An analysis of computer-assisted instruction including definition, principles, role, design

considerations, authoring systems, authoring languages, evaluation considerations, cost effectiveness and implementation strategies. Writing educational computer programs including characteristics, documentation, models, objectives, program code, programming style, debugging considerations. Advanced programming procedures (BASIC, PILOT) and advanced graphics programming. 81-251/252; 6 Credit Hours; Undergraduate; Fall, Winter.

COMPUTERS IN THE CLASSROOM SPECIALIST: Leadership, organizational, and interpersonal skills necessary to assume a consultative, resource or supervisory role in computer-based education. Current issues and implications of computer-based learning across the curriculum. Considerations in the design, development, implementation, management, control, supervision and evaluation of a computer-based learning system. Problem identification. Planning literacy guidelines. Attitudes toward computers and computerized instruction. The computer as an extention to non-traditional computer disciplines. Computers and exceptional students (including learning disabled, mentally handicapped, physically handicapped, gifted). Specialized devices for the exceptional child. Use of microcomputers in a research capacity. Troubleshooting procedure. Artificial intelligence. 81-351/352; 6 Credit Hours; Undergraduate; Fall, Winter.

UNIVERSITY OF WINNIPEG

Inquiries: Ms. Pat Benell, Program Officer, University of Winnipeg, 515 Portage Avenue, Winnipeg, Manitoba R3B 2E9.

USING MICROCOMPUTERS IN EDUCATIONAL ADMINISTRATION: This course has been developed especially for Manitoba school principals, superintendents, and other school administrators. The three main areas to be covered are: Records Keeping, deals with saving time and space, while at the same time improving efficiency and accuracy; Word Processing; Educational Programming, specific information will be provided to help you understand the different uses to which software may be put. SYS 009; Non-Credit; Spring, Fall, Winter.

USING MICROCOMPUTERS IN THE CLASSROOM — INTRODUCTORY: This course is designed for teachers who have little or no experience with microcomputers. It will feature a hands-on approach and will cover such topics as: operation of microcomputers, use of microcomputers in the classroom, BASIC programming, sources of courseware, design of computer literacy programs, design of computer assisted learning materials. SYS 010; Non-Credit; 4 Weeks, Spring, Fall, Winter.

USING MICROCOMPUTERS IN THE CLASSROOM — ADVANCED: For teachers who have some experience with microcomputers, this course will be oriented toward classroom use of microcomputers. Topics will include: design and implementation of computer literacy courses, computer graphics using a motivational approach to teaching programming, integration of computer assisted instructional packages into the curriculum, a review of educational software materials, introduction to LOGO. SYS 026; Non-Credit; 4 Weeks; Spring, Fall, Winter.

INTRODUCTION TO LOGO PROGRAMMING: This introductory course in LOGO programming is designed to give the student basic literacy in LOGO. The course will also examine, the type of uses to which LOGO may be put in the classroom. Hands-on programming will be emphasized. SYS 018; Non-Credit; 1 Week; Spring, Fall, Winter.

LOGO PROGRAMMING AND CURRICULUM DESIGN: This course examines the relationship between LOGO programming in classroom settings and the stimulation of cognitive development. In addition, some background in major theories of cognitive development will be presented. Rudimentary literacy in LOGO is assumed. SYS 019; Non-Credit; 2 Weeks; Spring, Fall, Winter.

LOGO PROGRAMMING AND CURRICULUM DESIGN FOR THE SPECIAL NEEDS CHILD: A significant characteristic of LOGO is its potential for generating growth in cognitive skills. For special needs children, work with LOGO does not involve tedious and exhausting rehearsal of material which the child is cognitively unable to assimilate but for the growth of cognitive structures which will permit assimilation of a variety of material. A section of the course will focus on the usefulness of LOGO for attentionally underfocused (impulsive) children. SYS 035; Non-Credit; 1 Week; Spring, Fall, Winter.

ARTIFICIAL INTELLIGENCE AND THE FIFTH GENERATION: Current developments in Artificial Intelligence will be discussed through a series of two-hour lectures. This course will introduce you to the new generation of logic based machines. Included will be: decision algorithms, problem solving strategies, language processing capabilities. SYS 038; Non-Credit; 4 Weeks; Spring, Fall, Winter.

INTRODUCTION TO BASIC PROGRAMMING: This course is designed to provide those who have little or no computer experience or training with a working knowledge of the BASIC programming language. The student will gain an understanding of computers and will receive hands on supervised training, programming in the BASIC language. Topics will include: What is a computer? What is BASIC? Why use BASIC? design and elements of the language, example programs. SYS 005; Non-Credit; 5 Weeks; Spring, Fall, Winter.

INTERMEDIATE BASIC PROGRAMMING: This course is designed to provide a person who has had some introductory BASIC programming training or experience with additional tools to use. Topics to be discussed will include: review of introductory BASIC, subroutines and sub-programs; arrays, text handling, random numbers, output formatting, exercises in programming, hands on BASIC programming experience. SYS 023; Non-Credit; 5 Weeks; Spring, Fall, Winter.

ADVANCED BASIC PROGRAMMING: This course is designed to help you use the BASIC programming language in the solution of problems utilizing the microcomputers. Topics will include: brief review of BASIC language, random and sequential file handling techniques, input/output operations, sorting techniques, documentation requirements and techniques, specialized applications, different dialect of the language. SYS 006; Non-Credit; 5 Weeks; Spring, Fall, Winter.

INTRODUCTION TO COMPUTER: This course is designed to give the student an understanding of how computers work in a business environment. A brief introduction to BASIC programming language will be part of this course. The lecture material will be reinforced by

access to a computer via terminals. SYS 001; Non-Credit; 1 Week; Spring, Fall, Winter.

INTRODUCTION TO MICROCOMPUTERS: This course is designed to provide persons with little or no computer experience or training with an introduction to microcomputers. The student will receive a broad overview of microcomputers and will gain an understanding of some of the techniques available for using these devices in their day to day life and work. SYS 002; Non-Credit; 1 Week; Spring, Fall, Winter.

MICROCOMPUTERS: THEIR PERIPHERAL DEVICES: In this course you will learn how video displays, keyboards, printer, tape and disk drives work. Prerequisites — MICROCOMPUTERS: UNDERSTANDING HOW THEY WORK and MICROCOMPUTERS: THE HARDWARE CONCEPTS: SYS 034; Non-Credit; 8 Week; Spring, Fall, Winter.

MICROCOMPUTERS: THE HARDWARE CONCEPTS: In this course, the second of the series, you will examine a typical microcomputer in detail. Knowledge gained in MICROCOMPUTERS: UNDERSTANDING HOW THEY WORK will be built upon. Topics to be discussed are: microprocessor chip, instruction set, programming techniques, communications via parallel and serial ports, operation of the complete system. SYS 027; Non-Credit; 8 Week; Spring, Fall, Winter.

MACHINE LANGUAGE PROGRAMMING: 6502 MICROPROCESSOR: This course is designed (1) to give you an understanding of the structure of the 6502 microprocessor, (2) to learn and use the machine language it supports, and (3) to take advantage of some of the existing machine language subroutines. Instructor lectures and demonstrations will be done using a microcomputer and students will have access to microcomputers, during class time to assist in the learning process. SYS 013; Non-Credit; 10 Weeks; Spring, Fall, Winter.

MICROCOMPUTERS: INTERFACING METHODS: This course shows how the microcomputer communicates with the electrical and mechanical devices. Prerequisites — MICROCOMPUTERS: UNDERSTANDING HOW THEY WORK and MICROCOMPUTERS: THE HARDWARE CONCEPTS. SYS 033; Non-Credit; 8 Week; Spring, Fall, Winter.

DEMYSTIFYING THE COMPUTER: Changing technology in the home, school and workplace has brought about a need for the demystification of an increased accessibility to microcomputers for women who have not as yet been exposed to them. This course will answer many questions as to their use and impact of the family, as well as providing hands-on experience with the machines. SYS 032; Non-Credit; 4 Week; Spring, Fall, Winter.

PORTFOLIO MANAGEMENT AND FUNDAMENTAL SECURITY ANALYSIS: This course is designed to enhance the decision-making process as to security selection through fundamental analysis. In it you will develop information management techniques that will complement traditional methods of security analysis. New methods for maintaining and evaluating securities portfolios will be included. SYS 031; Non-Credit; 5 Week; Spring, Fall, Winter.

SELECTING MICROCOMPUTERS FOR BUSINESS: This course has been developed especially for business people with little or no computer experience. Learn how to put your priorities into perspective before selecting a microcomputer. Emphasis is placed on assessment of needs and justification for the purchase of a system. SYS 022; Non-Credit; 6 Week; Spring, Fall, Winter.

INTRODUCTION TO USING MICROCOMPUTERS IN STOCK MARKET ANALYSIS: This course will review the fundamentals of stock market analysis and will introduce some associated computer applications. You will benefit from this course if you have minimal experience from both these fields and are interested in exploring the potential of the computer at an introductory level, in stock market analysis. SYS 028; Non-Credit; 5 Week; Spring, Fall, Winter.

DATA COMMUNICATION USING MICROCOMPUTERS: This course will be of interest to those who wish to develop an understanding of the principles of data communication and who want to learn the "Whys and Hows" of implementing it in their particular environment. The course is also appropriate for those who work with minicomputers, larger business computers and word processing systems, since the basic principles are the same for all systems. SYS 011; Non-Credit; 4 Week; Spring, Fall, Winter.

YOU AND YOUR VIC 20: This course is designed to aid the beginning programmer. The course will concentrate on the use of the Commodore VIC-20 microcomputer. The computer and its peripherals will be discussed as well as the BASIC language, programming applications (including animation) and program design. SYS 025; Non-Credit; 4 Week; Spring, Fall, Winter.

WORD PROCESSING FOR SECRETARIAL/CLERICAL/SUPPORT STAFF: This course will teach you to complete your work faster as well as more efficiently. The time you save may be your own. The practice and suggestions you receive will bring you closer to being a professional Word Processor. Topics to be included: general features of word processors, what hardware features make life easier, software samples and examples, banking formats, file handling, manuals and self-teaching. SYS 014; Non-Credit; 7 Weeks; Spring, Fall, Winter.

YORK UNIVERSITY

Inquiries: Mr. Lew Lowther, Room 132, Calumet College, York University, Atkinson Phase 1, 4700 Keele Street, Downsview, Ontario M3J 1P3

PERSONAL COMPUTERS: Word processing and programming. AS/CC 1630.06 D&E, AS/CC 1630.06GH; 6 Credit Hours; Undergraduate; 27 Weeks; Fall, Winter.

COMPUTER ROLES IN EDUCATION: Word processing, programming, data base management, spreadsheets, filers, Educational Philosophy. AS/CC 1910.06; 6 Credit Hours; Undergraduate; 27 Weeks; Fall, Winter.

PERSONAL COMPUTERS (ENRICHED STREAM): Word processing and programming. AS/CC 1630.06L; 6 Credit Hours; Undergraduate; 27 Weeks; Fall, Winter.

Inquiries: Mr. Peter H. Roosen-Runge, Department of Computer Science.

MACHINE STRUCTURE: Introduction to machine structure, assembly language, system programmikng, graphics, device drivers, in context of micros. Note: Students must have their own computer to take this section. COSC 2020.06; 6 Credit Hours; Undergradutae; 26 Weeks; Fall, Spring.

MICROCOMPUTER SYSTEMS: Micro processors, system intergration, interface design, CP/M, Lisa/Macintosh interface, event-driven OS, software development on micros. 4110.03; 3 Credit Hours; Undergraduate; 13 Weeks; Spring.

Inquiries; Office of Student Programmes, N801 Ross Building, Faculty of Education.

COMPUTERS IN THE CLASSROOM — AN OVERVIEW: PART I: This course is designed to give educators an overview of the uses of computers in education. The central themes will relate to teaching about computer literacy, teaching with the aid of a computer and computer applications in the classroom. A number of useful software packages that highlight concepts will be demonstrated. Examples will be drawn from a variety of subject areas in both the elementary and secondary panels. Please note that this course emphasizes the use of the computer in the classroom rather than computer programming skills. It is not a preparation for teaching specialized computer studies courses. ED/COED 3600.08; 6 Credit Hours; In-Service Credit; 24 Weeks; Spring, Fall, Summer.

COMPUTERS IN THE CLASSROOM — TEACHING WITH COMPUTERS: PART 2: Focus will be directed towards implementation of the computer as a resource across the curriculum for elementary and secondary students. As well as reviewing and extending the material of the Part 1 overview course, particularly highlighted will be the use of the microcomputer for word processing as a means for creative writing and for information storage and retrieval systems. The candidate will be encouraged to view the computer as a means of developing creative and logical thinking patterns in the learning environment. Practical experience with educational learning materials will be provided. Please note that this course emphasizes the use of the computer in the classroom rather than computer programming skills. It is not a preparation for teaching specialized computer studies courses. ED/COED 4610.08; 6 Credit Hours; In-Service Credit; 24 Weeks; Spring, Fall, Summer.

COMPUTERS IN THE CLASSROOM — SPECIALIST: This course is designed to give candidates a broad perspective that enables them to be conversant with important issues and to better articulate philosophy related to the role of computers in education and society. Leadership, organizational, and interpersonal skills necessary to assume a resource, consultative or supervisory role in curriculum and staff development will constitute a main theme. As well, implementation, evaluation techniques, useful ideas in dealing with exceptional students and an understanding of the development of computer based learning materials will be studied. Please note that this course emphasizes the use of the computer in the classroom rather than computer programming skills. It is not a preparation for teaching specialized computer studies courses. ED/COED 4620.08; 6 Credit Hours; In-Service Credit; 24 Weeks. Spring, Fall, Summer.

BUSINESS EDUCATION — DATA PROCESSING: PART 1: This course will prepare candidates to design computer studies material on a modular basis. Candidates will study the teaching strategies for computer concepts, applications of computers in society, and problem-solving techniques using the computer. Instruction in typewriting methodology is an integral part of the program. ED/BEDP 3600.08; 6 Credit Hours; In-Service Credit; 24 Weeks; Spring, Fall, Summer.

BUSINESS EDUCATION — DATA PROCESSING: PART 2: A study is conducted of the teaching of subject fields related to data processing. The integration with data processing of studies in accounting and business machines applications is covered in a segment on curriculum development. Teaching strategies and support materials, especially those applicable to the senior grades, are studied and developed. ED/BEDP 4610.08; 6 Credit Hours; In-Service Credit; 24 Weeks; Spring, Fall, Summer.

BUSINESS EDUCATION — DATA PROCESSING: SPECIALIST: This course examines teaching strategies in the specialized areas of advanced problem-solving and information systems. Stress is on curriculum development and teaching competency in the senior division. A study is conducted of all Ministry guidelines in business education, with special attention to data processing. Candidates will explore the duties and responsibilities involved in operating a business education department. ED/BEDP 4620.08; 6 Credit Hours; In-Service Credit; 24 Weeks; Spring, Fall, Summer.

COMPUTERS IN SPECIAL EDUCATION: This course is designed to give educators an overview of computer applications in special education. Issues to be examined include the computer as a learning/teaching tool in the delivery of instruction to exceptional students; the computer as an interface device between these students and their environment; and the interaction of hardware and lessonware to provide an effective vehicle through which the abilities of exceptional individuals can be optimized or enhanced. Examples of application will be drawn from across the spectrum of exceptionalities in the public school system and various specialized treatment centres. No previous computer experience is required. ED/EDEX 4630.08; 6 Credit Hours; In-Service Credit; 24 Weeks; Spring, Fall, Summer.

ALGONQUIN COLLEGE OF APPLIED ARTS AND TECHNOLOGY

Inquiries: S.M. Donaldson, Business Department, Algonquin College, 315 Pembroke Street E., Pembroke, Ontario K8A 3K2.

COMPUTER APPLICATIONS TO SMALL BUSINESS: Data base, management, spreadsheets. 29603; 4 Hours/Week; Post Diploma; 15 Weeks; Fall, Winter.

MICRO COMPUTER OPERATOR: Word processing, spreadsheets, utilization, contemporary office skills. 01123; 24 Hour/Week; Undergraduate; 24 Weeks; Fall.

Inquiries: Mr. Ken Colburn, Electronics/Computing Science, Algonquin College, 200 Lees Avenue, Ottawa, Ontario K1S 0C5.

MICROPROCESSOR SYSTEMS AND APPLICATIONS: Programming operating systems, word processing, spreadsheets, data base manager. 84455; 9 Credit Hours; Undergraduate; 16 Weeks; Spring.

Inquiries: Ms. Diane M. Joanisse, Data Processing Department, School of Business, Algonquin College, 1385 Woodroffe Avenue, Nepean, Ontario K2G 1V8.

INTRODUCTION A L'INFORMATIQUE (BIBLIOTECHNIQUE): Dbase II on DY-4 systems. 62083F; 5 Credit Hours; Undergraduate; 14 Weeks; Winter.

INTRODUCTION AUX ORDINATEURS ET A LA PROGRAMMATION I: SuperCalc on DY-4 systems. 27011F; 5 Credit Hours; Undergraduate; 2 Weeks; Fall, Winter.

INTRODUCTION AUX ORDINATEURS ET A LA PROGRAMMATION/LABORATOIRE: Basic on TRS-80, Z-80 on TRS-80. 27261F/51F; 10 Credit Hours; Undergraduate; 16 Weeks; Fall.

CONCEPTION STRUCTUREE DE SYSTEMES: Dbase II on DY-4 systems, 2 projects. 27013F; 5 Credit Hours; Undergraduate; 9 Weeks; Winter.

INTRODUCTION AUX SYSTEMES: SuperCalc on DY-4 systems, Dbase II on DY-4 systems, Word processing on IBM PC. 27202F; 5 Credit Hours; Undergraduate; 3 Weeks; Winter.

APPLICATIONS ET DEVELOPPEMENT DE SYSTEMES: Dbase II on DY-4 systems, SuperCalc on DY-4 systems. 23063F; 5 Credit Hours; Undergraduate; 4 Weeks; Winter.

Inquiries: Mr. Bob Fawcett, Data Processing Department.

MICROCOMPUTERS: Basic, microcomputers, graphics, business application. 27254; 5 Credit Hours; Undergraduate; 8 Weeks; Summer.

SYSTEMS AND APPLICATIONS DESIGN: Spreadsheets. 23063; 5 Credit Hours; Undergraduate; 2 Weeks; Winter.

DATA BASE: Data base. Uses: IBM PC. 27025; 5/4 Credit Hours; Undergraduate; 14 Weeks; Fall.

COMPUTERS AND PROGRAMMING I: Word processing, data base, management, spreadsheet. Uses: TRS-80. 27011; 5/4 Credit Hours; Undergraduate; 14 Weeks; Fall, Winter.

CANADORE COLLEGE OF APPLIED ARTS AND TECHNOLOGY

Inquiries: Mr. William Jenkins, Chairman, Business, P.O. Box 5001, Canadore College, North Bay, Ontario P1B 8K9.

ACCOUNTING ON THE MICROCOMPUTER I: Spreadsheets, word processing, data base related to accounting applications. ACC330; 4 Credit Hours; Undergraduate; 16 Weeks; Fall.

ACCOUNTING ON THE MICROCOMPUTER II: Accounting software, advanced spreadsheets, data base management, graphics, word processing. ACC331; 4 Credit Hours; Undergraduate; 16 Weeks; Spring.

MICROCOMPUTERS FOR BUSINESS I: Introduction to word processing, spreadsheets, data base software related to business applications. BUS330; 4 Credit Hours; Undergraduate; 16 Weeks; Fall.

MICROCOMPUTERS FOR BUSINESS II: Advanced word processing, spreadsheets, data base management software related to business applications. BUS 331; 4 Credit Hours; Undergraduate; 16 Weeks; Spring.

Inquiries: Mr. John Philip, Computer Science.

MICROCOMPUTER CONCEPTS AND TECHNIQUES: An introduction to word processing, spreadsheets, and data base software. EDP102; 2 Creidt Hours; Undergraduate; 16 Weeks; Fall, Spring.

BASIC PROGRAMMING I: Basic programming — introduction. EDP103; 3 Credit Hours; Undergraduate; 16 Weeks; Fall, Spring.

BASIC PROGRAMMING II: Basic programming — advanced. EDP141; 3 Credit Hours; Undergraduate; 16 Weeks; Spring.

MICROCOMPUTER APPLICATIONS: Word processing, computer graphics, data base, spreadsheets. EDP160; 3 Credit Hours; Undergraduate; 16 Weeks; Spring, Fall.

COMPUTERS IN FOOD SERVICES: An introduction to word processing, spreadsheets and data base software. EDP172; 2 Credit Hours; Undergraduate; 16 Weeks; Spring.

UNDERSTANDING COMPUTERS: Word processing, data base, spreadsheets related to business applications. EDP175; 2 Credit Hours; Undergraduate; 16 Weeks; Spring.

BASIC PROGRAMMING: Advanced programming. PCT150; 3 Credit Hours; Undergraduate; 16 Weeks; Spring.

COMPUTER PROGRAMMING: Basic programming. PRG100; 2 Credit Hours; Undergraduate; 16 Weeks; Fall.

COMPUTER PROGRAMMING BASIC: Basic programming. PRG101; 2 Credit Hours; Undergraduate; 16 Weeks; Fall.

Inquiries: Mr. Harry Burton, Teaching Master.

INSTRUMENTATION: Word processing, data base, spreadsheets. INS210; 3 Credit Hours; Undergraduate; 16 Weeks; Spring.

MICROCOMPUTER PROCESSING: Introduction to word processing, data base, spreadsheets. MCP100; 3 Credit Hours; Undergraduate; 16 Weeks; Spring.

MICROCOMPUTER PROCESSING: Advanced levels of word processing, data base, and spreadsheets. MCP200; 3 Credit Hours; Undergraduate; 16 Weeks; Fall.

FANSHAWE COLLEGE

Inquiries: Mr. A.Fouts, System & Program Coordinator, School of Business, Fanshawe College, P.O. Box 4005, London, Ontario N5W 5H1.

COMPUTER APPLICATIONS: Word processing, data base — health records. COMP 273; 4 Credit Hours; Undergraduate; 15 Weeks; Spring, Fall.

MIS: Accounting systems on IBM PC. SYST 607; 3 Credit Hours; Graduate; 15 Weeks; Spring, Fall.

COMPUTER APPLICATIONS (LAW & SECURITY): Word processing and data base, programming law and security. COMP 213; 2 Credit Hours; Undergraduate; 15 Weeks; Spring, Fall.

LIBRARY APPLICATION: Library application programming and word processing on IBM PC. LIBR 411; 2 Credit Hours; Undergraduate; 15 Weeks; Spring, Fall.

INFORMATION PROCESSING IN SOCIETY: Programming introduction and word processing on IBM PC. COMP 104; 3 Credit Hours; Undergraduate; 15 Weeks; Spring, Fall.

MIS: Data base (DB II), information systems studies use of spreadsheets (Lotus or Visicall). MGMT 609; 3 Credit Hours; Graduate; 15 Weeks; Spring, Fall.

ACCOUNTING BUS SYSTEMS: Accounting systems on IBM PC, use of spreadsheet Visicall or Lotus. SYST 404; 3 Credit Hours; Undergraduate; 15 Weeks; Spring, Summer.

INTRODUCTION TO DATA PROCESSING: Programming BASIC and DP theory. COMP 111; 4 Credit Hours; Undergraduate; 15 Weeks; Spring, Fall.

COMPUTER APPLICATIONS: BASIC programming files. COMP 202; 4 Credit Hours; Undergraduate; 15 Weeks; Spring, Fall.

DP BUSINESS SYSTEMS: Data base DBII, systems training — IBM PC. SYST 403; 5 Credit Hours; Undergraduate; 15 Weeks; Spring, Summer.

DP BUSINESS SYSTEMS: Introduction systems, spreadsheet analysis, etc. SYST 302; 5 Credit Hours; Undergraduate; 15 Weeks; Spring, Fall.

SYSTEM DESIGN: Configuration design nation-wide computer networks and microcomputer distributive function. Feasibility analysis software, hardware, etc., use of IBM 4341 and a CORVUS/IBM PC network are integrated in design. SYST 602; 6 Credit Hours; Graduate; 15 Weeks; Summer.

SYSTEM ANALYSIS: Manufacturer industry software for micros and design analysis for total business manufacturing systems including use of a CORVUS/IBM PC network (and IBM 4341 CICS programming system). SYST 501; 6 Credit Hours; Graduate; 15 Weeks; Spring, Fall.

PRODUCTION SYSTEMS: Production theory for MRP and production systems, theory supports SYST 503, SYST 501. SYST 505; 3 Credit Hours; Graduate; 15 Weeks; Spring, Fall.

PRODUCTION SYSTEMS OPERATIONS: Bill of material, data base design, system programming on IBM PC. SYST 503; 4 Credit Hours; Graduate; 15 Weeks; Spring, Fall.

OFFICE PROCEDURES: Word processing (Wordstar) and other office products used in secretarial. ADMN 602; 6 Credit Hours; Graduate; 15 Weeks.

FINANCE: Finance systems on IBM PC. FNCE 500; 4 Credit Hours; Undergraduate; 15 Weeks; Spring, Fall.

PURCHASING: Inventory and production systems IBM PC products. BSNS 301; 3 Credit Hours; Undergraduate; 15 Weeks; Spring, Fall.

BUSINESS SYSTEMS: Word processing, data base DB II, spreadsheets — secretarial (Wordstar, DB II, Visicall). SYST 300; 4 Credit Hours; Undergraduate; 15 Weeks; Spring, Fall.

Inquiries: Coordinator, Math Department.

COMPUTER OPERATIONS (BASIC) — TECHNOLOGY: Computer operation is stressed; loading, running, saving, recalling, printing, editing to specified changes. Comprehension of programs is covered and re-assembly of program parts to solve additional problems. MATH 139; 4 Credit Hours; Undergraduate; 15 Weeks; Spring, Fall, Summer.

COMPUTER OPERATIONS(BASIC) — TECHNICIAN: Computer opertion is stressed: loading, running, saving, recalling, printing, editing to specified changes. Comprehension of programs is covered, and re-assembly of program parts to solve additional problems. MATH 140; 4 Credit Hours; Undergraduate; 15 Weeks; Spring, Fall, Summer.

COMPUTER PROGRAMMING — TECHNOLOGY: Programming: problem-solving using algorithms and flowcharts; confirmation of solutions by translation to BASIC and computer output. MATH 259; 4 Credit Hours; Undergraduate; 15 Weeks; Spring, Fall, Summer.

LAMBTON COLLEGE OF APPLIED ARTS AND TECHNOLOGY

Inquiries: Mr. Herman E. Kempe, Coordinator, Systems & Computers, Lambton College, P.O. Box 969, Sarnia, Ontario N7T 7K4.

DATA BASE I: Data base — "Progress" (Relational Data Base Package), — "Seed" (Heirarchial Data Base Package), — "DBASE II (Microcomputer Data Base Package). BUS 138; 2 Credit Hours; Undergraduate; 14 Weeks; Spring.

DATA BASE II: Data base — "Progress" (Relational Data Base Package), — "Seed" (Heirarchial Data Base Package),DBase II (Microcomputer Data Base Package). BUS 238; 4 Credit Hours; Undergraduate; 15 Weeks; Fall.

COMPUTER OPERATING SYSTEMS: Operating systems. Types of Micros: DOS, VMS, UNIX, MVS, OS, RMS, RDOS, IBM PC, CADMUS, Supermicro, MacIntosh, Commodore 64, LISA, APPLE IIe. BUS 230; 4 Credit Hours; Undergraduate; 14 Weeks; Spring.

PROJECT MANAGEMENT: Micro-package, project Scheduler 5000 by Scitor Management Planning. BUS 239; 4 Credit Hours; Undergraduate; 15 Weeks; Fall.

SYSTEMS ANALYSIS AND DESIGN II: Micro Graphics Package: "Chartmaster", "Spreadsheets", "Framework" integrated Management Support Package. BUS 335; 8 Credit Hours; Undergraduate; 14 Weeks; Summer.

MANAGEMENT SCIENCE: Data trigue, Lotus 123 spreadsheets, Query language(s). BUS 255; 4 Credit Hours; Undergraduate; 15 Weeks; Fall.

DATA COMMUNICATIONS III: Modems, data communications, networking, ethernet, IMB PC communications, Inet 2000 Service. BUS 336; 3 Credit Hours; Undergraduate; 14 Weeks; Summer.

INTRODUCTION TO DATA PROCESSING: Word processing, programming "BASIC". BUS 134; 4 Credit Hours; Undergraduate; 15 Weeks; Fall.

MOHAWK COLLEGE OF APPLIED ARTS AND TECHNOLOGY

Inquiries: Mr. John Knechtel, Chairman, Part-time Studies (Technology), Mohawk College, P.O. Box 2034, Hamilton, Ontario L8N 3T2.

INTRODUCTION TO MICROCOMPUTERS: Computer concepts, computer programming, microcomputers. COM 01; 30 Credit Hours; Microcomputer Certificate Program; 10 Weeks; Fall, Winter, Spring.

MICROCOMPUTER TEXT-EDITING & INTEGRATED SOFTWARE: Word processing, text editors, spreadsheets, databases, integrated software. COM 02; 30 Credit Hours; Microcomputer Certificate Program; 10 Weeks; Spring, Fall, Winter.

MICROCOMPUTER SPREADSHEETS & INTEGRATED SOFTWARE: Spreadsheets, integrated software, text editors, databases, integrated software, microcomputer applications. COM 03; 30 Credit Hours; Microcomputer Certificate Program; 10 Weeks; Fall, Winter, Spring.

MICROCOMPUTER SYSTEMS ANALYSIS AND DESIGN I: System analysis, microcomputer selection, microcomputer information systems, databases. COM 04; 30 Credit Hours; Microcomputer Certificate Program; 10 Weeks; Fall, Winter, Spring.

MICROCOMPUTER DATABASES & INTEGRATED SOFTWARE: Databases, integrated software, spreadsheets, text editors, microcomputer applications. COM 05; 30 Credit Hours; Microcomputer Certificate Program; 10 Weeks; Fall, Winter, Spring.

NIAGARA COLLEGE OF APPLIED ARTS & TECHNOLOGY

Inquiries: Ms. Gail M. Hilyer, Director, Continuing Education Services, Niagara College, P.O. Box 1005, Woodlawn Road, Welland, Ontario L3B 5S2.

TYPING ON A COMPUTER, INTRODUCTION TO: An introductory typing course utilizing the personal computer keyboard and Typing Tutor Software, rather than the conventional typewriter. COMP 070; College Certificate; 8 Weeks; Fall, Winter, Spring.

MICROCOMPUTERS: APPLICATIONS IN SMALL BUSINESS: Owner/Managers of small business establishments will be introduced to the potential applications of microcomputers to streamline their financial, inventory control, and other record keeping and word processing systems. An opportunity will be provided for individual advisement on specific questions and concerns. COMP 064; College Certificate; 8 Weeks; Fall, Winter, Spring.

PERSONAL COMPUTER PROGRAMMING, BASIC, INTERMEDIATE: Registrants who already have an introductory level knowledge and skill of programming in the BASIC language will be taught more advanced programming techniques, matrices, data files, data manipulation, and flow charting. COMP 060; College Certificate; 8 Weeks; Fall, Winter, Spring.

COMPUTER GRAPHICS: This is an introductory level course using the BASIC language in which emphasis is placed on the screen manipulation of graphic characters. This will be of particular interest to those interested in learning how to create computer games, animation, graphic arts and technical data presentation. COMP 063; College Certificate; 6 Weeks; Fall, Winter.

WORD PROCESSING ON A MICROCOMPUTER: Using Easy Writer software on the IBM-PC, students will be introduced to word processing. COMP 056; College Certificate; 6 Weeks; Fall, Winter, Spring.

Inquiries: J.L. Parrett, Registrar.

BASIC COMPUTER PROGRAMMING: Introduction to BASIC computer programming and its use in simple problem solving in manufacturing engineering problems. COMP 118; Undergraduate; 16 Weeks; Fall.

COMPUTER INFORMATION MANAGEMENT SYSTEMS: Development of computer literacy for future management applications. COMP 102; Undergraduate; 16 Weeks; Fall.

BASIC COMPUTER PROGRAMMING: BASIC computer programming language applied to solve a variety of technical problems. COMP 137; Undergraduate; 16 Weeks; Fall.

COMPUTER APPLICATIONS: Microcomputer data processing applications in the field of education and related fields. COMP 232; Undergraduate; 16 Weeks; Fall.

MATHEMATICS: Fourth term mathematics course including an introduction to microcomputing using the BASIC language. MATH 243; Undergraduate; 16 Weeks; Winter.

BASIC ON MICROCOMPUTERS: Introduction to the BASIC language on a microcomputer. COMP 246; Undergraduate; 16 Weeks; Fall, Winter.

LIBRARY DATA PROCESSING I: Basic computer data processing applications in the library, including an overview of current hardware and software. Introduction to BASIC programming and specific library computer applications. COMP 301; Undergraduate; 16 Weeks; Winter.

COMPUTER PROGRAMMING: BASIC language studied as an aid to manufacturing applications, use, modification and upgrading of programs. COMP 318; Undergraduate; 16 Weeks; Fall.

LIBRARY DATA PROCESSING II: Involves programming, systems considerations, database management, word processing and applications of commercial software packages in a library environment. COMP 401; Undergraduate; 16 Weeks; Fall.

BASIC COMPUTER PROGRAMMING: The use of BASIC computer language to solve a range of civil and survey technology problems, becoming familiar with time-sharing systems, batch systems, and simulation programs. COMP 447; Undergraduate; 16 Weeks; Winter.

MATHEMATICS IV (CHEMICAL TECHNICIAN): An introduction to microcomputing using the BASIC language. MATH 425; Undergraduate; 16 Weeks; Winter.

SECRETARIAL DATA APPLICATIONS I: Makes use of DOS, Multiplan dBase 2 and Chartmaster on the microcomputer to prepare and update accounts receivable, accounts payable, inventory records, financial statements, statistical tables and charts. SECL 115; Undergraduate; 16 Weeks; Fall, Winter.

KEYBOARDING FOR TEXT/DATA ENTRY: Basic word processing functions, keyboard techniques for microcomputer applications. SECL 150 Undergraduate; 16 Weeks: Winter.

NORTHERN COLLEGE OF APPLIED ARTS AND TECHNOLOGY

Inquiries: E.F. Baumert, Dean, Box 2002, Northern College, South Porcupine, Ontario P0N 1H0.

WORD PROCESSING PRODUCTION: Word processing for secretaries. AO-3-40 & AO-4-40; 5 Credit Hours; Undergraduate; 15 Weeks; Spring, Fall.

WORD PROCESSING TRANSCRIPTION: Word processing for secretaries. SE-2-13; 5 Credit Hours; Undergraduate; 15 Weeks; Fall.

DATA BASE: BC-4-74 & BC-5-74; 3 Credit Hours; Undergraduate; 15 Weeks.

ADVANCED PROGRAMMING: Programming of IBM PC's. BC-1-80 & BC-2-80; 5 Credit Hours; Undergraduate; 15 Weeks; Spring, Fall.

MICROCOMPUTERS: BC-1-20 & BC-2-20; 4 Credit Hours; Undergraduate; 15 Weeks.

APPLICATIONS PROGRAMS: Introduction to word processing, spreadsheets, data base. BC-1-50 3 Credit Hours; Undergraduate; 15 Weeks; Spring, Fall.

APPLICATIONS PROGRAMS: Introduction to word processing, spreadsheets, data base. BC-2-50 4 Credit Hours; Undergraduate; 15 Weeks; Spring, Fall.

ST. CLAIR COLLEGE OF APPLIED ARTS & TECHNOLOGY

Inquiries: Mrs. Margaret Artinian, Chairperson, Law & Office Administration, St. Clair College, 2000 Talbot Road West, Windsor, Ontario N0A 6S4.

WORD PROCESSING APPLICATIONS I: WI 100; 3 Units of Credit; Undergraduate; 16 Weeks; Spring, Fall.

WORD PROCESSING APPLICATIONS II: WI 200; 6 Units of Credit; Undergraduate; 16 Weeks; Spring.

WORD PROCESSING APPLICATIONS III: WI 300; 6 Units of Credit; Undergraduate; 16 Weeks; Fall.

WORD PROCESSING APPLICATIONS & SIMULATIONS IV: WI 400; 6 Units of Credit; Undergraduate; 16 Weeks; Spring.

MICROCOMPUTER APPLICATIONS I: Calendaring, legal and medical software. WI 301; 3 Units of Credit; Undergraduate; 16 Weeks; Fall.

MICROCOMPUTER APPLICATIONS II: Spreadsheets. WI 401; 3 Units of Credit; Undergraduate; 16 Weeks; Spring.

ST. LAWRENCE COLLEGE OF APPLIED ARTS & TECHNOLOGY

Inquiries: R.S. Graves, Dean, Business Department, St. Lawrence College, P.O. Box 6000, Kingston, Ontario K7L 5A6.

INTRODUCTION TO COMPUTERS AND INFORMATION PROCESSING I: Data processing, word processing, spreadsheet, BASIC programming, IBM PC - PC/DOS. IP 01; 60 Credit Hours; Undergraduate; 15 Weeks; Spring, Fall, Summer.

INTRODUCTION TO COMPUTERS AND INFORMATION PROCESSING II: BASIC programming, IMB PC, PC/DOS. IP 02; 60 Credit Hours; Undergraduate; 15 Weeks; Spring, Summer.

Inquiries: Ron Robinson, Dean, Technology.

PROGRAMMING COMPUTERS I & II: Superpet, graphics, process control, basic programming, mathematical algorithm. MC21, MC22; 60 Credit Hours; Undergraduate; 15 Weeks; Spring, Fall.

SHERIDAN COLLEGE OF APPLIED ARTS & TECHNOLOGY

Inquiries: Coordinator, Courseware, Design and Production, School of Applied Arts, Sheridan College, Trafalgar Road, Oakville, Ontario L6H 2L1.

COMPUTER CONCEPTS IN EDUCATION: Computer literacy for teachers. CCE 1300; 3 Credit Hours; Undergraduate; 17 Weeks, Spring, Fall; 6 Weeks, Summer.

SOFTWARE ANALYSIS AND EVALUATION I: Summative evaluation of computer-assisted learning materials. SAE 1301; 3 Credit Hours; Undergraduate; 17 Weeks, Spring, Fall; 6 Weeks, Summer.

SOFTWARE ANALYSIS AND EVALUATION II: Formative evaluation of computer-assisted learning materials. SAE 1302; 2 Credit Hours; Undergraduate; 17 Weeks, Spring, Fall; 6 Weeks, Summer.

APPLIED EDUCATIONAL CONCEPTS: Educational theory and practice in relation to the design of computer-assisted learning. AEC 1301; 3 Credit Hours; Undergraduate; 17 Weeks, Spring, Fall; 6 Weeks, Summer.

INTRODUCTION TO VISUAL DESIGN: Computer graphics for computer-assisted instruction. VDN 130; 3 Credit Hours; Undergraduate; 17 Weeks, Spring, Fall; 6 Weeks, Summer.

EDUCATIONAL COMPUTER PROGRAMMING: Programming for computer-assisted instruction. ECP 130; 3 Credit Hours; Undergraduate; 17 Weeks, Spring, Fall; 6 Weeks, Summer.

INSTRUCTIONAL DESIGN: Instructional systems design for computer-assisted instruction. DES 1300; 3 Credit Hours; Undergraduate; 17 Weeks, Spring, Fall; 6 Weeks, Summer.

DESIGN FOR INTERACTIVE TECHNOLOGIES: Interactive video. DFT 1300; 3 Credit Hours; Undergraduate; 17 Weeks, Spring; 6 Weeks, Summer.

PROBLEM SOLVING FOR INSTRUCTIONAL SYSTEMS: Project management techniques for computer-assisted instruction. PSS 1302; 2 Credit Hours; Undergraduate; 17 Weeks, Spring, Fall; 6 Weeks, Summer.

FIELD PRACTICE: Development of computer-based learning systems. PRA 1300; 6 Credit Hours; Undergraduate; 17 Weeks, Spring; 6 Weeks, Summer.

INTRODUCTION TO COMPUTERS: An introduction to computer concepts, functions and applications with specific emphasis on educational applications for preschool children. TTC 1201; 1 Credit Hour; Undergraduate; 17 Weeks; Fall.

Inquiries: E.H. Bangay, Dean, School of Computer Studies.

MICRO PROGRAMMING I: PGM 3160; 3 Credit Hours; Undergraduate; 17 Weeks; Spring, Fall, Summer.

HARDWARE AND SOFTWARE EVALUATION: Microcomputers, software. HSE 3252; 1.5 Credit Hours; Undergraduate; 17 Weeks; Spring.

DESIGNING THE INTEGRATED OFFICE: Systems analysis, office automation. DSN 3402; Undergraduate; 17 Weeks, Fall.

Inquiries: G.A. Closson, Computer Studies Coordinator, Part-time and Continuing Education.

MICROCOMPUTER PROGRAMMING II: PGM 3162; 3 Credit Hours; Undergraduate; 24 Weeks; Spring, Fall.

DBASE II, INTRODUCTION: Data base, management. EXT 1802; 1 Credit Hour; Undergraduate; 1 Week; Spring, Fall.

DBASE II, ADVANCED: Data base, management. EXT 1801; 1 Credit Hour; Undergraduate; 1 Week; Spring, Fall.

IBM-PC DOS: Disk operating systems. EXT 1806; 1 Credit Hour; Undergraduate; 1 Week; Spring, Fall.

LOTUS 1-2-3: Data base, management, spreadsheets, graphics. EXT 1800; 1 Credit Hour; Undergraduate; 1 Week; Spring, Fall.

IBM-PC USE AND APPLICATIONS: Word processing, data base, management, spreadsheets. EXT 1803; 1 Credit Hour; Undergraduate; 2 Weeks.

DATA COMMUNICATIONS — WIDE AREA NETWORKS: Electronic communications. EXT 1822; 1.1 Credit Hour; Undergraduate; 1 Week.

NETWORKING — LOCAL AREA NETWORKS: Electronic communications. EXT 1826; 1 Credit Hour; Undergraduate; 1 Week.

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in others. Little if any mention is made in the CERI report of uses of the NIT in the SLRC or of teaching students about using computers as tools to access information. Access to data banks or telematic networks is usually listed as being at the experimental stage, as in computer assisted instruction.

This situation is also evident in educational programs outside the school. A summary of case studies on the **Information Society and General Education** (Lariccia, 1984), also prepared for the CERI conference, listed no projects which directly supported the use of computers in a library setting. The projects reviewed included computer camps/plays/festivals, computer centres and exhibitions, computers or telematics in the home, and computer clubs. Although several projects describe setting up computer centres for both student and general public use, these are either special centres or those set up at museums or exhibitions. Projects in both France and the U.K. focused specifically on telematics and the provision of on-line information sources but both of these emphasized in-home use of this service; none mentioned libraries.

Some of the difficulty in getting information about the use of computers in SLRCs relates to the absence of school libraries in various countries. Although library resource centres exist in secondary schools in certain countries, they often do not exist in elementary schools. In many other countries all resource materials needed are located in the classroom. In some cases these are supplemented with resources from public libraries or regional resource centres. In a number of instances these city or regional centres are not run by the educational authorities but are the responsibility of municipal or regional governments.

Thus, those systems with well-developed school library resource centres are giving at least some attention to the use of the NIT in them. Where the resources are the responsibility of the teacher the approach is different and more concern is placed on their use in the classroom. In some cases this situation is complemented by a higher degree of central control over curriculum. If the same set of resources, both required and supplementary, is used throughout the educational system in a country, there is less need and reason for a school library as a resource centre for classroom instruction. It is entirely possible for regional centres or public libraries to fill the resource functions necessary.

In order to get a grasp on the specific impact of the NIT on SLRC the need for more data became obvious. In an attempt to fill in some of the gaps, a brief 15-item questionnaire was developed. This was then distributed to the central education authorities in 12 of the countries which had attended the CERI conference. Responses were received from 7 - the United Kingdom, Ireland, South Australia, Belgium, Denmark, Sweden, Finland and Australia. The questionnaire focused specifically on the use of the NIT in school library resource centres, the training of staff, and the perceived long range impact of the NIT on SLRCs. Although certainly not comprehensive, the results are interesting and provide at least some measure of international trends in this area. A summary of the findings follows.

Where school library resource centres existed, they did generally hold AV materials in addition to books and periodicals. The exception was the U.K. where there was no evidence that secondary school libraries "generally" held AV materials and the practice in primary schools was varied and little documented. In Sweden, Finland and Denmark schools do not usually have libraries but are rather served by municipally run libraries and/or regional AV centres.

The situation with regard to the presence of computer software in SLRCs was much different. Only South Australia stated that many had computer software while the U.K. and Belgium stated that some had computer software. In Denmark the regional AV centres had computer software while in the other countries software was held at the classroom level.

Based on this, it is obvious that the responsibility of SLRC personnel was primarily to loan traditional print and AV materials. In addition, involvement in previewing/reviewing print and AV materials was listed by South Australia, Denmark, Finland and Belgium. The U.K., South Australia, Belgium, and Denmark suggested at least some involvement of SLRC personnel in accessing information databases via computer. Only South Australia, Sweden and Belgium listed any involvement in media education programs through the SLRC.

Several questions focused specifically on the use of computers. It seems evident that comparatively few of the SLRCs in the countries responding to the survey had computers. The country with the most was the U.K. where 70% of secondary SLRCs had computers. In Belgium about 25% of SLRCs had them while 10% did in South Australia. In Denmark all regional AV centres had computers. Elsewhere the computer presence was in the school generally, not in the resource centre. For instance, in Ireland all schools have a computer and in Finland all secondary schools do.

Because of the small number of SLRCs with computers, the use is obviously still developing. In South Australia, Denmark and Belgium the primary use appears to be for administrative purposes. However, in South Australia and Belgium local computer-based bibliographic databases are being developed while in the U.K. and Belgium computers are used, to some extent, to access on-line databases. The U.K. and Belgium indicated computer-based networking system are being used in at least some schools. Denmark and South Australia mentioned experimental uses of such system.

As might be expected, the level of training of personnel reflected the existence, or lack, of a well-developed SLRC program. In most countries responding, the SLRC personnel had teacher education plus some level of additional training in library technology. Additional training related to NIT ranged from one-day training sessions to short courses. When asked what additional training SLRC staff should have in relation to AV materials, the answers were very similar and related to equipment operation, use of AV resources and production of materials. The answers were somewhat more variable when computer training needs were addressed. The U.K., Ireland and Sweden suggested that training in using computers for imformation storage and/or retrieval was needed. In Sweden and Belgium the need for training in using and/or adapting existing software were listed.

Finally, the questionnaire considered the overall effect of the NIT on the SLRC. When asked what the impact of the NIT, particularly computers, was or would be on SLRCs, the answers focused on three areas. The U.K. indicated it would be on training students in how to use computers to access information. Ireland, South Australia, Denmark and Belgium all suggested the general use of computers by schools to access information. South Australia, Finland, Denmark and Sweden listed the administrative uses of the computers as a major impact.

When asked what was the single most important role that SLRCs had to play in

the use of NIT in education, the answers took two general forms. The U.K. and South Australia both emphasized the importance of students learning to use computer-based information sources. The other countries responding were not as specific and listed as most important the provision of information and/or "resources" to schools.

From the results of the survey the developing nature of the use of the NIT is obvious as are the different approaches to school library resource centres. In those countries without a tradition of local school libraries the impact of the new technology is felt mainly in the classroom. It also follows that the NIT are likely to be incorporated in regional AV centres in much the same way that film and other resources have been. The developments in these countries do not seem as relevant to the Canadian situation where library resource centres commonly play a more central role in the school.

In countries where the school library resource centre is common, more questions are raised about the specific role the NIT should play. Most interesting is work going on in this area in the U.K. and, to some extent, France. What is emerging in both of these countries is a new category of teacher, one who is the coordinator for the application of the NIT in a school (Gwyn, 1984). In France this is the result of a teacher training policy which provides an extensive year-long program for select groups of teachers who will then have the responsibility for training other teachers. In the U.K. it is a condition of provision of hardware. Although not specifically aimed at SLRC personnel in either country, it would seem a natural extension of the work of those personnel. As outlined in the CERI (Gwyn, 1984) paper on **New Teaching Functions and Implications for New Training Programmes** these "NIT Coordinators" would:

- Be identified as resource persons, knowledgeable about the NIT, to whom their colleagues can turn for informal advice;
- Take a lead, more formally, in school-based in-service training;
- Be responsible for the management of NIT hardware and software resources and of technical support staff;
- Contribute to software design and development;
- Advise headteachers and school managements on acquisitions policy as well as on longer-term education development. (p.6)

In Canadian terms, this would certainly seem an approach that conforms with our concept of the services that should be provided through the SLRC.

The approach in the U.K. adds one other essential element which also concerns the SLRC. Although the U.K. government's Microelectronics Education Programme primarily focuses on developing "a steady stream of new employees ready and able to work with information technology as it is found in the real world" (MEP, 1983), the program includes as one of its topics the instruction of students in the use of the computer as a means of information retrieval from databases. Certainly SLRC personnel are the logical people to carry out this instructional task.

Perhaps most interesting of all is an approach for the U.K. suggested by Gilman (1983) in a paper prepared for the Council for Educational Technology titled **Information Technology and the School Library Resource Centre.** The approach is two-fold and well summarized in the following quote:

> The computer is a school-wide resource rather than the preserve of any one particular subject area. As such, its use needs to be organized and managed on a school-wide basis, and its software integrated with the school's total collection of book and audio-visual resources. The department within the school most suited to such a role is, I suggest, the school library resource centre, on the basis of its existing involvement with the servicing of the requirements of the school's overall curriculum . . . Additionally, the school library resource centre's normal responsibility for the in-service training of staff in the use of audio-visual equipment, together with the instruction of pupils in the use of the library's bibliographical tools (catalogues, indexes, bibliographies, and the like), makes it the obvious department to be made similarly responsible for the provision of instruction and practice in information retrieval skills and techniques to both pupils and their teachers. (p.73)

Accomplishing these tasks within the SLRC will not be easy. For instance, as suggested by Gilman, one of the first difficult tasks is acquiring a computer for the SLRC. Yet this is essential if the centre is to achieve centralized control of the administration of the school's micro-resources. The second problem, although perhaps easier to overcome, is the decision to include a component on instruction uses of databases in the curriculum and a recognition of the appropriateness of the SLRC as a logical location to carry out the instruction.

Perhaps one final comment is necessary. The reader will note in this review an absence of emphasis on any suggestion of a radical change in the fundamental nature of the library. This is not for lack of writing on this subject. For instance, Iichman (1982) suggests:

> Much of what we normally call the library's holdings will constitute the computing center's holdings . . . or a network to which we belong . . . What has passed for librarianship, and for acquisition, cataloguing and circulation of books surely will be substantially different in the future. (p. 9)

While current in some circles, particularly universities, this view is not reflected in what is actually happening in school library resource centres. This, in large measure, arises from the teaching role school libraries play as opposed to the research role university libraries play. However, I would also hope it reflects the sentiments so well expressed by Kanes (1982), "Libraries have been able to provide spaces where thinking is optimized" (p. 32). As he points out, the library is a **place** for wrestling with ideas and meaning and important **tangible** sources of history, science, dreams, etc. Libraries allow browsing in a fashion not possible with a database. Nothing compares to eyeing a book, picking it up and immersing oneself in other worlds, in the mysteries of science, the delight of history and myriad other subjects. It is not just the ideas, words and pictures but the physical surroundings, even the silence, which are conducive to thought, imagination and wonder.

The new information technologies are having and will continue to have an impact on school library resource centres. The approach suggested by Gilman for the U.K. and the results of the survey done suggest two fundamental roles for the SLRC in dealing with the NIT. One is the management of all educational resources, including those associated with the NIT; the other is the instruction of students in the use of those resources and others new to the school, such as online databases. Both arise out of the traditional role of the library resource centre and thus represent an evolution in its development rather than a radical change. Let us hope that this is an accurate assessment and that, while taking on new functions, the library does not lose its essential function as a place for thinking and imagining.

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STANDARDS

Continued from page 11.

teacher-librarians and principals report satisfaction. This approach is now documented in a publication entitled "Collection Development in School Libraries" (Educational Media Team/Media Services Group; Calgary Board of Education, 1984).

There is little good rendered when the school library and its staff spend the major portion of their time dedicated to inform acquisition. It is of little comfort to select the most apparently useful book, periodical, photograph, or videodisc if the students are unable to apply independent critical judgement to their use of the resource and determine its application to their study or their life. There is every need in the development of new standards to rethink and re-present the concept of scope and sequence. This concept must be one that sheds the information locational approaches taken within traditional library skills programs. It must rather integrate the broadest information needs of students with the total curriculum and program expectations of the school. Far too many teachers and teacher-librarians have neglected scope and sequence and its relationships to the resource oriented program when good teaching is dependent upon it.!

There is definitely a need for new standards — standards that will outline the developmental steps needed to ensure the provision of appropriate facilities — facilities that provide access to systems of resource networks, quickly providing information about the latest news developments and that blend the best elements of computer technology with other modes of image and voice delivery.

But the development of new standards will be of little meaning unless placed in a societal context. Jane Anne Hannigan expresses these concerns well when she talks of overriding principles that must accompany any revisions. She calls for an understanding of personal freedom and its concomitant requirement for a commitment to the respect of privacy. She calls for a sensitivity to guard against information overload and to know that "human beings must still be recognized and respected as the orchestrators and controllers of that information" (Jane Anne Hannigan, "School Media Standards", **Library Trends,** Summer 1982, p. 53).

The development of new standards offers a new opportunity to examine the essential role that the school library — and its human and material resources — occupies in the educational environment. Standards that concentrate too much upon the nature of the facility, the size of the collection, or the faster delivery of information will do a disservice to students. The essence of the school library lies in its integral relationship to the school program and in the integral relationship of the teacher-librarian to teaching and learning. It is time to stop saying that the school library "supplements" and "complements" the school program. The school library is not the tablecloth on a well-graced table. It is the basic food offered for the educational sustenance of all students.

LETTER TO THE EDITOR

Editor:

It was with a good deal of concern that I read Marvin Duncan's "Preparing Personnel for School Media and Library Service Positions: Some Observations" in the March, 1985 issue of the **Canadian Journal of Educational Communication.** Not only was Duncan's analysis of the American situation superficial but it was just that: an analysis of the **American** situation without any indication in the article or by the editor that the role competencies and terminology in Canada are quite different. Readers unfamiliar with the current direction and thrust of teacher-librarianship in Canada, consistent with **Resource Services for Canadian Schools,** would draw the conclusion that Duncan describes the Canadian situation rather than the American one. Without knowledge of the Canadian context it would be difficult for a reader to recognize the inherent differences from the situation described by Duncan.

We certainly have our own set of problems in providing effective resource services at the school and district levels in this country but they are **not** the same problems as necessarily exist in school districts south of the border. We are inundated by the American professional literature; surely our own professional literature can address our own issues and help debate their resolution.

Yours truly,
Ken Haycock

Editor's note: In retrospect, a preliminary statement identifying the author's viewpoint as American might have been useful. It was simply an editorial decision that the paper stood alone without such identification. Certainly any confusion which may have arisen among readers thinking that Mr. Duncan was referring to or extrapolating to the Canadian scene is to be regretted.

On the second point, Mr. Haycock suggests that perhaps CJEC should restrict itself to Canadian issues and topics. Again, the policy of this editor is to accept submissions from any source, within the domain of educational technology.

Finally, Mr. Haycock should be more pleased with this issue of CJEC which does precisely what he has suggested, in providing a forum for a Canadian viewpoint on issues which jointly confront the media and library professions, including Mr. Haycock's own useful analysis.

D. Hlynka

From the Media Periodicals

by Richard Ellis

BRITISH JOURNAL OF EDUCATIONAL TECHNOLOGY, 16:1, January 1985

Murphy, P.J. & Hodgson, B.K. "Computer-assisted learning, project work and the aims of scientific education"
Preece, Jenny & Jones, Ann. "Training teachers to select educational computer software: results of a formative evaluation of an Open University pack"
Choat, E., and others. "Investigating educational television and the curriculum for young children: some pilot phase features"
Robinson, Brent. "Media in education research: are the new electronic media a threat to literacy or a challenge for the literate?"

CLASSROOM COMPUTER LEARNING, 5:7, March 1985

Kohl, Herbert. "Classroom management software: beware the hidden agenda"
Olds, Henry F. "A new generation of word processors"
Moore, Herb. "What shape does music have?"

CLASSROOM COMPUTER LEARNING, April/May 1985

Brady, Holly & Slesnick, Twila. "Girls don't like fluffware either".
Dyrli, Odvard Egil. "After the shakeout. . . who will be king? "Software buyer's guide"

COMPUTERS IN EDUCATION, February 1985

Leousis, Elias. "Black sheep and Logo"

COMPUTERS IN EDUCATION, March 1985

Howe, Jim. "Logo programming and intermediate mathematics"
Brown, Jane L. "Up the student: down the machine"
Rimmer, Steve. "Commodore Plus 4 review"

COMPUTERS IN EDUCATION, April 1985

Allan, Roger. "The thrust behind the image: Part I"
Fountain, Laurie. "Go Logo"

EDUCATIONAL COMMUNICATION AND TECHNOLOGY, 32:4, Winter, 1984

Fosnot, Catherine Twomey. "Media and technology in education: a constructionist view"
Petkovich, Michael D. & Tennyson, Robert D. "Clark's 'Learning from media': a critique"

EDUCATIONAL TECHNOLOGY, 25:2, February 1985

Gallini, Joan K. "Instructional conditions for computer-based problem-solving environments"
Jackson, Lorraine Morlock & Yamanaka, Ellen. "Measuring women's attitudes, goals, and literacy towards computers and advanced technology"
Wedman, John & Strathe, Marlene. "Faculty development in technology: a model for higher education"
Duquette, Cheryll. "Formative evaluation of courseware: one instrument"
Katz, Sandra & Aronis, John M. "Inquiry: a computer program based on rhetorical theory"
Jonassen, David H. "The real case for using authoring systems to develop courseware"

EDUCATIONAL TECHNOLOGY, 25:3, March 1985

Kearsley, Greg P. & Frost, Jana. "Design factors for successful videodisc-based instruction"
Sattler, Joan L. "Microcomputer integration in special education teacher preparation"
Johnson, Craig W. & Orban, Deborah A. "Light pen as magic wand: computerize classroom visual aids using an extended BASIC"
Montague, Elaine C. & King, Richard A. "Which computer competencies are most needed by school managers? A comparison of the views of computer experts and school principals"
Bell, Margaret E. "The role of instructional theories in the evaluation of microcomputer courseware"
Shermis, Mark D. "A data base management approach to computer-based training"
Larason, Larry, & others. "A minicomputer-based CAI laboratory for developmental education: an academic library's experience"

JOURNAL OF COMPUTER-BASED INSTRUCTION, 12:1, Winter 1985

Hofstatter, Fred T. "Perspectives on a decade of computer-based instruction, 1974-84"
Van Dyk, Tim A.M. & others. "Motives for CAI in post-secondary education"
Wesley, Beth Eddinger, & others. "Locus of control and acquisition of computer literacy"
Sawyer, Teresa A. "Human factors considerations in computer-assisted instruction"

MEDIA & METHODS, 21:6, February 1985

Friscia, Ninette F. "Computer using educators speak out"

MEDIA & METHODS, 21:7, March/April 1985

Horwitz, Charlotte A. "The future of the printed word"
Sokoloff, Michele. "Linking the new technologies with special education"
McEwing, Richard A. & Roth, Gene L. "Computer based instruction: an examination of communication patterns"

MEDIA IN EDUCATION AND DEVELOPMENT, 17:4, December 1984

Priestman, Tim. "Interactive video and its applications"
Roach, Keith. "Interactive video: the Cardiff experience"
Clark, David R. "The role of the videodisc in education and training"
Williams, Keith. "Interactive videodisc at the Open University"
Griffiths, Michael. "Planning for interactive videodisc"
Parsloe, Eric. "Learning by doing"
Doyle, Terry. "BBC foreign language teaching programmes"

Mediography

MEDIA ON VIDEO

by Nancy Lane

The focus of this column is on the many aspects of video production. Also included are three new productions dealing with the effects of television on the viewer.

BASIC TELEVISION TERMS: A VIDEO DICTIONARY Motion Picture, Pyramid/ITF, 1977 17 min., sd., col.
Looks at the production of television shows. Discusses terminology.

CABLE TV AS EDUCATIONAL MEDIA Videorecording, Wayne State Univ., 1983 30 - 30 min. tapes., sd., col.
A look at the cable TV industry and its applications. Titles include: Studio/Remote Production, the Cable System Operator, Program Evaluation, Future Technologies.

CETO TELEVISION TRAINING FILMS Motion Picture CETO/Grt Plains, 1970-71-72 24 programs — 19-32 min. ea., sd., col/b&w
This series covers television production techniques — graphics, lighting, make-up, camera shot, editing, etc.

COLOUR TELEVISION I Motion Picture, Open U/ITF, 1977 25 min., sd., col.
This program demonstrates and explains some of the properties of colour relating to television systems.

COLOUR TELEVISION II Motion Picture, Open U/ITF, 1977
25 min., sd., col.
This program in the same series explains and illustrates the operation of the P.A.L. system.

THE EDIT Motion Picture, Mirus/Kinetic, 1983 - 13 min., sd., col.
Here, the focus is on editing techniques which can be used to change and distort video and film.

THE ELECTRONIC RAINBOW: TELEVISION Motion Picture, Pyramid/ITF, 1977 23 min., sd., col.
This program presents the history, technical operation and uses of television.

THE IMPACT OF TELEVISION Motion Picture, EB/VEC 1980 20 min., sd., col.
The effect T.V. has on the behavior and attitudes of viewers is the subject here.

MAGIC IN THE SKY Motion Picture, NFB, 1981 57 min., sd., col.
This film deals with an investigation of the impact of television on the Inuit people of Canada.

ON CAMERA Videorecording, BBC, 1984 4 programs varying in length from 17 - 58 min. ea., sd., col.
This is a BBC video production course. Titles are: The Camera, Planning a Programme, Interviews, Editing.

PREPARING A TELEVISION PROGRAMME Videorecording, 1968 35 min., sd., col.
This program follows the production of a current affairs program, with an emphasis on the role of the program researcher.

SHOCK WAVES Motion Picture, MTI/Magic Lantern, 1984 36 min., sd., col.
Through case studies and interviews, this program explores the effects of television on our society.

SIGHT AND SOUND OF VIDEO PRODUCTION Videorecording, 3M, 1977 10-30 min. programs, sd., col.
Titles include: Portable Videotape Production Techniques, Camera Techniques, How to Produce a Videotape Program.

TELEVISION Motion Picture, Open U/ITF, 1977 25 min., sd.,col.
A basic film demonstrating some of the technical aspects involved in television systems.

THE TELEVISION PICTURE AND THOSE WHO MAKE IT Motion Picture, BFA, 1980 24 min., sd., col.
Television production, from news to advertising, is the topic here.

USING MEDIA FOR LEARNING Videorecording, Assoc. for Ed. Com. & Tech. 1983, 30 min. ea., sd., col.
A series of 20 video programs. Three of the programs deal with video production. Titles are: Planning and Producing Multi-Media Presentations, Film and Video Techniques, Television.

VIDEO — A PRACTICAL GUIDE AND MORE Videorecording, Video Int'l Pub., 1980, 12 - 30 min. tapes., sd., col.
A series on video produciton. Titles include Producing a Videotape, Operation and Maintenance of a Video System, Format Analysis and Writing for Videotape.

MICROWARE

By Leonard F. Proctor

If you have suggestions or contributions that you would like to make to this column, please forward them to: Dr. L.F. (Len.) Proctor, Dept. of Educational Communications, College of Education, University of Saskatchewan, Saskatoon, Sask. S7N 0W0.

Microcomputer Acquisition Considerations

by M. Laucht

The acquisition and implementation of a microcomputer system involves many considerations beyond the purely technical details described in manufacturers' brochures and in the literature. This paper will outline some of these considerations.

User or Hobbyist?

Purchasers of microcomputer systems may be characterized as either "hobbyists" — those with a desire to own a microcomputer, or as "users" — those who feel that a microcomputer system may meet some specific needs. The distinciton between hobbyists and users is a necessary one since each has different expectations of, and requirements for, a microcomputer system.

A hobbyist is essentially free to choose, from among the many microcomputer, systems available, any system which strikes his fancy. The selection process need not be particularly rigourous. In fact, if a poor choice is made, the cost to the hobbyist is unlikely to exceed the actual purchase price of the microcomputer system.

A user must be more careful in his selection. The incidental costs of not meeting the need for which the system was purchased may greatly exceed the mere purchase price of the microcomputer system.

This paper will dwell on considerations of particular importance to users, rather than hobbyists.

The microcomputerization process as a whole, irrespective of the particular application involved, consists of:

- — setting goals and objections for the system
- — determining various implementation options
- — evaluating the implementation options and selecting the optimal one
- — implementing the selected option.

1 The setting of goals and objectives should occur prior to any detailed examination of implementation options, and certainly must occur before any evaluation takes place. Otherwise not only is the system design and selection rather difficult but those expectations which are then left unspecified, may be unclear or unrealistic. Such unspecified expectations very often remain unmet, resulting in dissatisfaction and frustration.

2 Once the goals and objectives have been set it is possible to determine the various implementation options. Among those to be considered should be non-microcomputerized options, possibly for example, time-shared access to a larger computer. Certainly manual, non-computerized solutions, including relatively simple procedural changes should also be considered. And yet another is the "do nothing" option — that is, to continue with the present system.

3 When evaluating the implementation options the usual criteria i.e. costs, functionality, ease of implementation, ease of use, etc., are likely to be important. As well though, it is useful to avoid being dazzled by the new, emerging technologies and to bear in mind that what a particular system can potentially do, and what it actually does do, may be several years apart.

4 Of particular importance when dealing with computerized systems of all sorts is that people, procedures and materials are not the only components. Also present are the two components of all computerized systems: the hardware (equipment), and the software (computer programs or instructions). If either of these is inadequate, or unreliable, the system will not function properly. In education, the latter, that is the software has received most attention.

5 While the capabilities and features of microcomputers and related hardware have increased in recent years, and quite dramatically so, and while the microcomputer of today might be as powerful as the minicomputer or mainframe computer of yesterday, it is not as powerful as the minicomputer or mainframe computer of today. The same advances which have so improved the price/performance ratio of microcomputers have improved it for other sizes of computers as well. A microcomputer cannot be expected to do everything that a larger computer can do.

6 Any computer (micro, mini or mainframe) will have limitations. Therefore, it is important to match a computer's features and limitations with the requirements of a particular application. If this is done the limitations should not be much of a problem. If, on the other hand, a purchase is made too quickly, and with too little forethought, then the whole process can be a discouraging and frustrating expeience.

7 When evaluating a particular manufacturer and his line of microcomputers, it is important to consider issues relating to the long term use and development of the computerized application. As needs evolve, the microcomputer system should evolve as well. Such evolution includes the purchasing of additional hardware (more memory, auxilliary storage, peripherals etc.), obtaining more software or upgrading to a larger computer. It is desirable to do all of this with as little impact on the operation of the system and as little modification to hardware or software as possible.

8 Another consideration is hardware reliability. Reliability data for microcomputers is not always easy to obtain, but many very well be worth the extra effort required. Polling users of a given microcomputer system may provide valuable insight. As well, since no manufacturer's products are blessed with an immunity to failure, it is desirable to ensure that high quality repairs and parts are available locally, quickly and at reasonable cost. If not, then it becomes necessary either to wait until equipment is repaired, or to make appropriate backup arrangements. The need for a good repair facility should not be dismissed too lightly.

9 Also of concern is a microcomputer manufacturer's reputation and future prospects. The longer the company has been in operation and producing microcomputers, the better the reputation of the product, the greater the variety

Continued on page 21.

* An earlier version of this paper appeared in the **Manitoba Science Teacher Volume XXIII**, Number 3, Summer 1982 under the title of "Microcomputer Pitfalls".

BOOKS

Personal Computers for Education
Alfred Bork
New York: Harper & Row, 1985.
Reviewed by Earl R. Misanchuk
University of Saskatchewan

Alfred Bork, a pioneer in the use of computers in education for nearly two decades, has written a refreshingly different book about computers in education. It is intended for a wide audience: teachers, university professors, educational planners and administrators, parents, and trainers. Bork's espoused purpose in writing the book was to provide a more balanced view of computers in education than available in other introductory books on the topic; I think he succeeds. In fact, I would put this book on the "must read" list for every educator who is involved in any way with computers in teaching, as well as for those educators who know nothing of computers yet, but feel they should. It should prove to be equally useful at all levels of education, from pre-school to university and continuing education.

Chapter 1 provides a good overview of the contents of the book, and suggests a reading sequence of only six of the 14 chapters for those who want to get the main points of the book without reading all 179 pages. Bork's writing, however, is so readable, so down-to-earth, so obviously written by an educator who has seriously considered the educational requirements of computers — rather than the gadgetry-oriented pipe dreams that frequently get published under the guise of introductions to computer literacy — that it is difficult **not** to read the whole book. To add further "spice", throughout the book are interspersed statements that those who are currently involved in promulgating computer literacy in the schools just might not like. A list of his comments critical of common practice would include, for example, that knowing how to write programs is not necessary to attain computer literacy; that high school curricula (and corresponding teacher education courses) which teach a variety of languages, instead of teaching good programming style with — at most — one language, are doing the wrong thing; and a strongly-worded admonition not to teach (or learn) BASIC, which he calls the "junk food of computer programming languages". He doesn't just offer them as opinions, either — he presents credible arguments to support them.

What distinguishes **Personal Computers for Education** from the horde of introductory computer literacy books for teachers is, in part, the arrangement of the chapters in the rest of the book, which is divided into three sections: **Modes of Computer Usage, Further Details About the Computer**, and **The Future.** The emphasis is on educational concepts, not on computers and computing concepts; in particular, the emphasis is on **learning** and computers. Reference to hardware does not come until Chapter 9, and even then, the presentation is conceptual, with minimal reference to bits, bytes, CPU's and all the other jargon that supposedly characterize the **computer literate.** Nowhere is there a chapter (or even a section of a chapter) entitled **The History of Computing!**

The first section consists of five chapters: **Learning to Program, Computer Literacy, Intellectual Tools, Computer-based Learning,** and **Management Systems.**

In Chapter 2, Bork presents a straightforward and concise description of the various elements that lead to good programming style; an explication of why one might want to learn how to program (while pointing out that the skill might not be necessary for the achievement of computer literacy); and a description of various approaches for learning a programming language, indicating that the most common method is not the most efficacious. A theme, picked up later in the book, emerges in this chapter: students can learn much from one another, and such peer learning should be encouraged in the learning of a computer language, since teamwork is common in the real-world application of the skills.

Chapter 3 deals with that elusive construct, computer literacy. After offering his own definition (which many will find less demanding than most other definitions, in terms of what one needs to know in order to be called computer literate), Bork lists (and justifies) the ingredients he considers necessary: social implications of the computer; common applications (word processing, spreadsheets, personal data systems, and other, area-dependent, applications); aspects of programming, particularly style; and a critical attitude toward computing. He quite deliberately omits hardware and extensive programming experience, and suggests that often, **no** exposure to programming is better than some, especially if that some involves BASIC. He concludes the chapter with a model curriculum for computer literacy spanning preschool to university.

Intellectual Tools, the fourth chapter, illustrates just how the computer can be applied as a tool in various subjects. Word processing, spreadsheets, paint programs, simulation languages, graphics, and electronic mail are illustrated in use. A concise, yet very understandable, introduction to Logo should give the novice reader sufficient understanding of that language to see how powerful concepts, such a top-down programming, procedures, and recursion, can be taught to even very young students. Bork points out Logo's warts, as well: it doesn't require the user to carefully define data types, and it emphasizes the logical side of programming at the expense of the data side. Despite the shortcomings, Bork bemoans the fact that few teachers ever get past the introductory, graphics-generating stage of learning Logo, as it is capable of performing quite well as a full-fledged language.

Chapter 5, **Computer-based Learning,** again reflects Bork's emphasis on learning, rather than teaching, and returns to the theme that students needn't always work as individuals: a great deal of very important learning takes place in the interchange among students when they work with a computer in a group. Bork describes and illustrates several examples of computer-based learning, including arithmetic drill and practice; sentence combining; some programs intended for young children; a physics program entitled **Batteries and Bulbs,** which he and his colleagues developed at the Educational Technology Center, University of California, Irvine; an electronics trouble-shooting program; "controllable words" programs; a logic course; a medical education course; and a spelling/reading program.

Testing, sequencing of materials, student databases, teacher aids (such as grade-books), and student aids form the content of the chapter entitled **Management Systems.** Another theme that is carried through the book — that multiple-choice questions, whether in instruction or in testing, are an obsolete technique that should never be used in computer-based learning — emerges here. Examples of the record-keeping systems used in a couple of computer-based learning systems are presented.

The second major section, **Further Details About the Computer,** contains

the chapters **Advantages and Disadvantages of Computers in Education, Teacher Evaluation of Computer Materials, Hardware — The Raw Computer, Practical Issues of Computer Use in Education,** and **Developing Curriculum Materials for Computers I** and **II** (two chapters).

Chapter 7 begins with a Verse and somewhat simplistic overview of three different theories of learning, which could leave the non-professional reader believing that teachers and curriculum materials designers actually fall neatly into one of the three schools of thought, rather than being somewhat eclectic in this regard. The advantages of computers cited, however — learners enjoy computers; true individualization, interaction, and visualization are possible; and learning occurs more rapidly with computers than with conventional instruction — as well as the disadvantages identified — there is very little good educational material available; few teachers have adequate knowledge of how to use computers effectively; the potential for problems vis-a-vis unauthorized access to student databases; and potential educational disparities based on affluence and accessibility to computers — are well covered.

Teacher Evaluation of Computer Materials is a chapter that should be read by anyone presuming to select educational computer programs. Bork lists a number of features of programs that should be evaluated critically (content, environment, approach, interaction, user-friendly interface, individualization, graphics, screen design, and sound) and gives another list of features that should count against any materials being evaluated (books via computer, dense screens, and multiple choice interaction). This chapter should be successful in its espoused purpose of "helping teacher **(sic)**, administrators, parents, and others to judge what computer-based learning material is satisfactory and what is not (p. 94)".

Chapter 9, **Hardware — The Raw Computer,** is in some senses the weakest in the book. While accepting that Bork's intent was not to provide great detail about hardware, I feel he gives some very important considerations short shrift. His message appears to be "buy for the future" when acquiring hardware; he claims that there is so little good and useful software currently available that one should not be impressed by salespersons' arguments that much educational software exists for certain machines. Instead, says Bork, one should buy "state of the art" machines, which he equates with 16-bit computers (despite the fact that the book carries a 1985 copyright date, there is no acknowledgement of the existence of 32-bit machines). He seems to assume that quality educational software will necessarily follow for those machines. Furthermore, he makes a considerable error of omission in not specifically pointing out that some of the wonderful programs he has described earlier in the book do not now, and probably never will, run on the computers he seems to recommend due to inter-machine incompatibility and lack of standardization, a topic he ducks completely. His comments on what to look for and think about when purchasing machines are too general to be helpful.

Practical Issues of Computer Use in Education deals with the various possible school and university environments for computers, and reminds the reader that a great deal more planning must go into the acquisition of computers than a decision to "get a couple and see what happens". Physical location and maintenance are just two of the concerns that must be addressed.

The two chapters entitled **Developing Curriculum Material for Computers** begin with a recounting of the process of producing a textbook; this is followed by an explication of the steps leading to computer-based curriculum material (pedagogical design, graphic design, implementation, evaluation, and improvement). The point becomes obvious: It is essentially silly to believe that a teacher, working evenings and Saturdays, can acquire the necessary skills and execute all phases of preparing computer-based learning materials, and come up with a good product. Authoring languages or systems, Bork contends, are no help, because they unnecessarily limit an author's capabilities; they lead to the development of poor materials. Even given sufficient time, for an individual to perform all phases of the process requires such a rare combination of skills that to recommend this model of development is unrealistic, suggests Bork. A detailed example of a small segment of a pedagogical design (the analog of a storyboard) illustrates fully what computer-based learning can be. For me, this was the most exciting part of the book; at the same time it was sobering, because it illustrates so profoundly the amount of creativity and work that must go into just a minute's worth of student learning time. Sections on screen design, coding, and review, evaluation and revision (the later with explicit criteria for all phases of the process — a valuable checklist!) illustrate just how specialized the roles of development team members have become.

Particularly of interest to me (reading the book in February) was his description of where most of the pedagogical design is actually done by the Educational Technology Center group: in the mountains of Southern California, at pool-side, or in a Jacuzzi!

The preparation of good computer-based learning materials continues to be an expensive process. Bork gives an example in which two hours' worth of program time costs $25,000 to develop fully. It seems clear that educational technology, in the face of the computer age, must give up one of its long-cherished philosophical cornerstones, local production. "Quality costs money" seems to be the message.

He rounds out the chapters on developing materials with eight points so germane that I repeat them here verbatim:

(1) Educators must insist on high quality material; it should be highly interactive, not booklike or lecturelike. Such simple-minded tactics as multiple choice should be avoided.

(2) Educators must be critical of existing material — most of what is available is junk.

(3) The test of any production system is in the quality of the product. Thus abstract arguments about production systems are not critical. Rather, in each case the material produced should be examined.

(4) Computers will become more valuable in learning as educators move from strictly behavioral viewpoints to viewpoints that take into account cognitive psychology.

(5) Group effort is needed to produce effective curriculum material. Most educators seem to agree with this, but many are still implicitly using tactics that derive from older nongroup strategies.

(6) Authoring languages and systems should not be used in the production of computer-based learning material. In most cases they lead to uninteresting or trivial material. However, authoring tools can be useful in the coding process.

(7) Far more experimentation in the development of computer-based learning material is needed. The best curriculum production systems can undoubtedly be improved.

(8) Educators' strategies need to be future-oriented, particularly toward the largescale production that will be necessary in the next few years.

The final and shortest section, **The Future,** contains chapters on **Future Computer Equipment,** and **Computers and the Future of Education.**

Chapter 13 is another weak one, and may readily be skipped. On the one hand, Bork becomes a little "pie-in-the-sky-ish"; on the other hand, he reports on "new" and "future" developments in chip technology and software that are already out of date, due to the time lag inherent in the publication of a book. Indeed, a few of his predictions, like his obviously biased view of the popularity of Pascal, have turned out to be, arguably, wrong.

The final chapter, however, should (must?) be read by all. He begins by making a bold prediction: computers will become the *dominant* (italics mine) delivery system in education at all levels. Citing the current problems education faces — decreasing favor and credibility among taxpayers, coupled with severly reduced budgets — he gives examples of how private enterprise is already moving in to fill the gap. It is not a pretty picture that he paints, but anyone at all concerned with education should take a long and hard look at it. Of course, Bork does offer up a hope of salvation: Not surprisingly, it is the increased use of computers to teach. He paints a compelling scenario in which computers do the content delivery, while teachers act as the ultimate source of help, and as socializers. I know, we've heard that song before — during the '60's, when the newly-discovered systems approach was to have married with educational media (especially television) to save education. It didn't work. But times are different now; and so are the tools. Maybe, just maybe, the availability of the power of the computer, coupled with societal discontent with the current state of education, will bring about the much-needed reform this time.

MICROWARE

Continued from page 18.

of accessories and software available, and the more fiscally stable (or growing) the company is, the more likely it is to remain in business. Or is it?

10 A user should, as much as possible, avoid becoming stuck with a technical orphan, that is a microcomputer whose manufacturer has gone out of business or has stopped supporting it. This means, that parts, repairs, accessories and software are likely to become increasingly difficult or expensive to obtain.

11 Software is as important as hardware. No matter how good, reliable or cheap a particular hardware configuration is, it is of little use if the required software, is not available or cannot be written to the functional, time and fiscal requirements imposed by the given application.

12 With every decrease in price for computing equipment, a new community of users and programmers is created. Each such community follows the same pattern. Software is initially unstructured, ad-hoc, unreliable, difficult to debug and difficult to maintain. As computer use by this community matures, the software development process also matures, resulting in more disciplined, more structured, more modular software which is easier to debug, to use and to maintain.

The design and development of such software is a complicated process involving the resolution of contradictory requirements by means of compromises and tradeoffs. Thus while programming was once an art, as practiced by professionals today, it is a discipline. If at all possible a user should avoid attempting to do this himself without adequate training.

Most people would not consider building their own hardware, yet many of these same people will seriously consider designing, creating, debugging, documenting and maintaining their own software. Great care should be exercised before taking this particular course of action.

13 When purchasing software there are essentially two options: custom-written software or ready-made, off-the-shelf software.

With custom-written software it is important to evaluate the software suppliers as carefully as the hardware suppliers. Programming a system which is to run correctly, effecitvely and reliably and which is to be maintainable (easily modifiable when changes are required), is a discipline requiring a methodical approach including analysis, development, debugging, testing and documentation. It is wise to ensure that the source of custom written software has the requisite training and experience.

It is especially important to beware of the technical hotshot. This is a programmer who can compress program instructions into the smallest possible amount of memory, who can write programs which execute exceptionally quickly or who talks incessantly about obscure technical details. Such experts are needed in specialized circumstances but not for most applications. Far more important than a program which is faster or more compact is a program which does what is required in a reasonably simple and straight forward, user friendly, efficient, reliable and maintainable a fashion as possible.

While having software custom written should provide a user with exactly what he specifies, he will also be getting software which is, by definition, a technical orphan. He faces essentially the same risks as for hardware technical orphans, especially potential problems in updating the software and in finding latent bugs.

In buying ready-made, off-the-shelf software, a user stands a better chance of getting reasonably priced, working software. It is also possible that upgrades and enhacements will be available. If a software supplier is selected carefully, buying software ready-made can significantly reduce risk and cost.

The price the user pays for this reduced risk is that he has to take what is available. While some customizing of off-the-shelf software is sometimes possible, there is never quite the freedom to specify the application as when the software is custom written.

No matter how the software is obtained it is important that it is of high quality, that it is easy to use, correct, reliable, and of course compatible with the hardware to be used.

A major concern about the quality of software is correctness. For an educational environment the correctness of software is no less critical than for other application areas. Because complete testing of programs is frequently difficult and often impossible, great care should be taken in selecting a source for software.

It is further necessary to ensure that the techniques used both for CAL programs and for other computer/student interactions are pedagogically sound.

Future evolution of the system should be kept in mind but one shouldn't get carried away and constantly change the functional requirements in an attempt to add every bell and whistle as one thinks of it. This will unduly delay the system's completion.

14 Beware of bargains. Good software is expensive and very time consuming to produce. Inappropriate or poor quality software is too expensive no matter how cheap it appears.

15 If compatible software and hardware are available from a variety of suppliers, so much the better. A great deal of "plug compatible equipment" (equipment which may be easily plugged into a system instead of the equipment originally intended for that system) and many software packages are now available from independent suppliers for many different microcomputers. As long as one is careful to ensure that what is bought is in fact compatible, such diversity of suppliers opens up many options, often at reduced cost.

One should be especially careful when purchasing a microcomputer simply because some other, preferred approach for the application is too expensive. The initial purchase price of the microcomputer is only one of the potential costs. Operating costs, software development, debugging and maintenance costs, hardware repair costs, hardware and software upgrade costs, and the cost of delays inappropriate system components etc. are much more difficult to calculate and are likely to be much more significant in the long run.

Microcomputers have great potential for education but as with every tool, one must select and use them carefully and appropriately. If one considers very seriously the potential pitfalls of (micro) computerizing an application as well as the potential benefits, as listed above then chances for a successful implementation will be greatly improved.

CURRICULUM RESOURCES

Continued from page 7.

debate the issue of school libraries and educational media, such a discussion trivializes the major issues. While we bemoan the lack of integration of different types of learning resources, particularly into effective programs, we focus too on the media and their collection and organization. In an information society more time and energy has to be devoted to national debate on using the resources we have available to us in effective instructional programs to teach youngsters how to process and use information.

To do that, we go right back to the promise of **Resource Services for Canadian Schools.** We need a clear aim for the program, a role for professional personnel which is clarified and focused, good programs to prepare this staff, a district approach to coordination of resource centres and their development in a unified system, staff development programs which focus on program development and enhancement, and a commitment to well-designed, well-integrated resource based learning programs for young people. This is really the least we can do with any degree of professional competence and respect.

MISSION POSSIBLE

Continued from page 9.

The standards contain both quantitative and qualitative statements, and "represent a compromise between 'what should be' as expressed in the literature and 'what is realistically attainable' in the present economic climate." It is intended that they be interpreted as minimum rather than desirable expectations.

The inclusion of quantitative standards for school library collections, staffing and facilities is always controversial. At once they are seen by schools exceeding them as too low, and by those at the other end of the spectrum as impossible to attain. According to responses to the questionnaire, about 36 percent of the school jurisdictions would have some difficulty phasing in the standards over a 3-5 year period.

Following are the standards for library staff and the school library collection.

Library Staff

1. Professional direction is critical to the development and implementation of an effective program.
   Professional direction may be provided through a variety of alternatives:
   a) By a full-time teacher-librarian on the school staff.
   b) By a teacher-librarian with a part-time library and part-time teaching assignment.
   c) By a teacher-librarian serving more than one school in the district.
   d) By supervision by a school district (central office) teacher-librarian.
   e) By cooperative agreement with a regional library system.
   f) Where no teacher-librarian is available, by the principal and teaching staff of the school.

Note: i) The minimum qualifications of a teacher-librarian should include teacher certification and successful teaching experience along with university credits in at least eight half courses in librarianship and instructional technology.
ii) Active participation on the part of the principal and teachers in the implementation of the library program must increase as teacher-librarian time is decreased.

2. Qualified technical/clerical support should also be provided.
3. Professional and technical/clerical support should meet or exceed the following standards:

School Size	Teacher-Librarian	Technical/ Clerical Support
150 Students	-	½ - 1
300 Students	½	½ - 1
500 Students	1	1
750 Students	1	1½ - 2
1000 Students over	1	2
1000 Students	1½ - 2	2½ - 3

The School Library Collection

1. The basic collection should support the major content areas of the instructional program and represent a balanced range of student interests and needs, including the appreciation of literature.
2. The size of the basic collection should be dependent upon the total student enrollment served, the number of grades taught in the school, the number and types of instructional programs, and accessibility of relevant materials through regional cooperation, networking and interlibrary loan arrangements.
3. The basic library collection for a school of 250 students should include:
   print and nonprint materials . . . 4,000 titles
   magazines . . . 20
   newspapers. . . 2
   pamphlets, pictures . . . to meet program needs
   film/video, etc. . . from Regional Film Centre, District IMC, ACCESS (Alberta Educational Communications Corporations) etc.

Note: 1. The above represents an average basic collection for 250 students regardless of the type of school (elementary, junior or senior high). The number of course offerings in junior and senior high is offset by more grade levels served in elementary school and the need for more books at the primary school level.

2. For schools with larger enrollments, the collection should be increased to meet the needs of the students and the instructional program.
3. The ratio of fiction to nonfiction and reference should range from 15% - 30% fiction and 70% - 85% nonfiction and reference depending upon accessibility and the nature of interlibrary loans available from other school, regional, public, college and university libraries.
4. The reference collection should include at least one current general encyclopedia.
5. Schools offering programs in both English and languages other than English, should increase the basic collection to include a comparable standard of materials (print and nonprint) to support instruction in the language(s) offered.
6. Selection criteria for the library collection should be consistent with:
   a) Guidelines for tolerance and understanding.
   b) Controversial issues policy statement.
   c) Canadian content priorities.
   d) Identified library program goals and objectives.
   e) Needs identified by students and teachers.
   f) Information from recognized selection tools.
7. An annual school library budget should be allocated for the purchase of new materials, supplies and equipment (if equipment is not provided for in the capital budget or some other budget category). The budget should be determined on the basis of the funds required to realize library program goals and objectives. It should be recognized that smaller schools and schools offering programs in English as well as languages other than English will require a higher than average allocation.

Scene V

The Department has several activities completed or underway to provide the means for accomplishing its responsibilities.

1. A description of over 30 schools throughout the province illustrating effective library program development and implementation, **Alberta School Libraries in Action** (Alberta Education, 1984), has been distributed to all superintendents. School addresses and phone numbers are provided so that advance arrangements can be made for on-site visits.
2. A model for an integrated school library program has been developed. A description of this model will be made available to all Alberta schools, spring 1985, in the form of a monograph.
3. Throughout discussions related to the new policy, continual reference was made to the need for inservice educational programmes for teacher-librarians, teachers and administrators. In 1984, Alberta Education established a new fund for teacher inservice education in the suggested priority areas of computer literacy, gifted and talented students, and evaluations. Added to these priorities for 1985/86 is school libraries. The grants provide for $9.00 per pupil in grades one through twelve, and $5.40 per early childhood services student. The guidelines for this funding focus on activities which will result in improved classroom instruction.
4. Since 1984, a number of special needs areas have been identified by Alberta Education for additional funding. These may vary from year to year. For 1985/86, additional support will be given for the enhancement of school library learning resource collections. These funds will be allocated to school boards on the basis of $10.00 per student or $1000.00 per school which ever is greater. The funds are to be applied in addition to, not as a subsitution for, the funds normally allocated for the development of library collections. In June 1986, boards will be expected to make an interim report of the utilization and impact of this funding, with a final report in June, 1987. School boards will be required to have documents on file that are consistent with the new library policy; a plan for priority needs for collection development; and an evaluation and selection policy approved by the school board.

The 4500 responses to the questionnaire are a testimony to the commitment of Albertans to improve school library services — from the leading man, David King, Minister of Education, to the 'cast of thousands' starring the L.R.C. and provincial library association, strongly supported by parents.

Educators have given a standing ovation to the initiatives taken by Alberta Education. Curtain calls are inevitable.

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STANDARDS REVISITED

Continued from page 5.

Harry Newsom (from his base in Edmonton and later in Kamloops) worked with the sub-committees which were situated in Winnipeg, Regina, Calgary, Edmonton and Vancouver. Since I was located in Toronto, I related with the groups in St. Catharines, Toronto, Guelph and London. Meetings of the national committee were held in Edmonton, Winnipeg and Toronto. These had to be kept to a minimum because of the costs involved. The principal coordination of the work of the various groups in western and central Canada was achieved by frequent meetings between Harry Newsom and me. Most of these work sessions were held in Winnipeg, although some were in Toronto and Kamloops.

Neither the Canadian School Library Association nor the Educational Media Association of Canada (or its successor, the Association for Media and Technology in Education in Canada) had the financial resources to support activities on such a large scale. The preparation of the manuscript might well have been impossible had it not been for the generous grant of $12,000.00 by the World Book Encyclopedia of Chicago and Toronto. With that assistance it was possible to pay for the postage, telephone charges and travelling expenses that were necessary.

We have now come full cycle in 1985 and it is again time to consider revision of the recommendations of **Resource Services for Canadian Schools.** We have today the same two options which we had in 1971: two separate books (one each published by C.S.L.A. and A.M.T.E.C.) or a single set of standards published by the two associations jointly.

The convenience is tempting for each organization to produce a unilateral statement of the true faith from its point of view, without the bother of developing a consensus with others in the field. It would be the easier way to go and more conducive to ego trips, both corporate and personal. It would, however, be a dereliction of duty.

The dangers which we face as librarians and media specialists, we face in common. When reduced funding undermines the provision of learning mateirals, all are affected. The negativism of the "back to basics" revisionists makes no distinction between us. Neither books nor films are safe from witch hunts. We are attacked in common and we must defend ourselves together. Any revision or the replacement of the present standards must be a joint A.M.T.E.C. - C.S.L.A. project.

The central issue is whether we want to recommed unified standards or to retrogress to separate sets of recommendations. It is **not** whether it should be a single larger book or a series of smaller ones dealing with various particularities of recommendations. That dichotomy is a red herring. Either comprehensive or modular publications can be produced cooperatively or separately. One of our options is to publish two separate books (or, if we go the modular route, ten or twelve booklets in pairs), competing with each other for sales, subtly contradicting and lessening one another's credibility. Our other option is to develop a consensus and to speak with united conviction and doubled authority to those who need to be convinced of the importance of learning materials in all media and to be shown how to use them effectively.

The members of the Association for Media and Technology in Education in Canada and of the Canadian School Library Association have an obligation to present the case for the acquisition, production and utilization of learning materials in every medium, not competitively so as to advance the fortunes of one association at the expense of the other, but cooperatively in a bond of union, that will be, for media specialists and librarians alike, the means of obtaining better protection against common dangers and of achieving greater success in common endeavors.

NOTES FOR THE GUIDANCE OF AUTHORS

The Editor is always pleased to receive for consideration articles on aspects of educational technology, media use and research likely to be of interest to readers. Topics of interest include: computer assisted instruction, learning resources centres, communication, evaluation, instructional design, simulation, gaming, and other aspects of the use of technology in the learning process. Two primary forms of contributions are welcomed: refereed articles, and notes and non-refereed articles. It is important that contributions conform to the notes below.

Notes and Non-Refereed Articles

1. Contributions for this category are welcomed from all members. Writers are encouraged to use a familiar, casual style. Jargon should be avoided.
2. Contributors to this section surrender to the editor the responsibility of final copy edit. Articles will not be returned for author approval prior to publication.
3. Contributions to this section do not require additional notes or references. If these are included they must adhere to the style guidelines for refereed articles.
4. Include your name, position, institution and mailing address.
5. Type contributions on 8 1/2 x 11 paper using a 60 stroke line, and double-spaced. Do not break words at the end of a line.
6. Non-refereed articles should be from one to five pages in length. Notes of upcoming events or other news should be one paragraph in length.

Refereed Papers

1. Manuscripts should be 5-20 double spaced, typed pages.
2. Include an abstract of about 100 to 150 words.
3. The author's name, position, institution, and mailing address should be on a separate page.
4. Authors should send three copies.
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7. **Main headings** should be centered and typed in upper case. **Secondary headings** should be typed at the left-hand margin, using upper and lower case underlined.
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   Table 1 about here.

9. References in the text should employ the author/date format (eg: Kowal, 1982). All references should be listed at the end of the paper in alphabetical order. The American Psychological Association Style Manual (2nd edition) should be referred to by all authors to ensure consistent reference style.
10. Spelling should conform to the Merriam-Webster **Third New International Dictionary.**

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