FINAL REPORT

OF

KEEWATIN REGIONAL EDUCATION AUTHORITY

PILOT EDUCATION PROJECT (KREA): COMPUTER ASSISTED LEARNING

ADULT EDUCATION KEEWATIN REGION

MAY 31, 1989

Heidi Wolter-Mullen

Director of Community Programs
Arctic College
Keewatin Campus.

CONTRIBUTIONS BY: - Keewatin Adult Educators

- Rod Taylor, Project Manager
  Superintendent of Advanced Education

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REPORT ON 2 YEAR PROJECT
OF
KEEWATIN REGIONAL EDUCATION AUTHORITY
PILOT EDUCATION PROJECT (KREA): COMPUTER ASSISTED LEARNING
ADULT EDUCATION KEEWATIN REGION

EXECUTIVE SUMMARY

This is a descriptive report of a 2 year Computer Assisted
Learning Project covering the period of May 15th,1987 to
May 14th, 1989.

PROJECT GOALS.

1. To improve and expand, through the implementation of
Computer Assisted Learning (CAL), academic upgrading, job
readiness and special skill training for adults in the
Keewatin Region. To respond to the special needs of
unemployed Inuit who were not reached in the past by
traditional training methods.

2. To provide specialized skills training to unemployed Inuit
and other members of the community that is not usually
available in small communities. Special attention will be
paid to areas of training where local employment is
available.

DESCRIPTION

The project is sponsored by the Keewatin Regional Education
Authority (KREA) and funded as a pilot project by Employment
and Immigration Canada (EIC) Innovations Program and The
Department of Advanced Education, Keewatin Region. Rod
Taylor, Superintendent of Advanced Education, developed the
project and was the Project Manager. Heidi Wolter, Director
of Programs, Arctic College was the Project Coordinator.
Patrick Fahy, Ph.D., Director of Research and Evaluation at
Alberta Vocational Centre was the independent evaluator
approved by CEIC. The project has been carried out by the
Adult Educators in all the communities in the Keewatin
Region, with the support of their education authorities.

The Innovations Program provided funding in the amount of
$1,285,000.00 over two years for computer hardware,
educational software, development of Inuktitut courseware,
casual instructors, furniture, administrative support and
external evaluation. The Department of Advanced Education
provided the equivalent dollar amount in person years,
facilities and program operation and maintenance costs.

EQUIPMENT

Computer systems were installed in all Keewatin communities in August 1987. In the first year system consisted of a Local Area Network (LAN) of either 5 or 8 computer terminal workstations, connected to a file server that stores the courseware, a printer and a communications modem. At the beginning of the second year the number of computers was increased to 10-12 in each community, except for Whale Cove.

The instructional package is Plato courseware providing Academic Upgrading for Grades 4 - 13. Plato is used three hours daily as part of the A.B.E. program. Business application sofware is also being used extensively. The use of business software increased during the second year and an Inuktitut word processing package was incorporated. An Inuktitut grammar course was developed and field tested during the spring of 1989 and will be used in all communities by September 1989.

ANTICIPATED RESULTS

The `Anticipated Results' of the project on the original proposal are as follows:

a) Attracting and maintaining interest of a greater segment of the target population in educational programs.
b) Producing faster progress in academic training
c) Providing job readiness skills.
d) Increasing chances of getting employment or improving level of employment.
e) The creation of a new more effective educational model for Inuit students that may be used throughout the Arctic.

FINDINGS

a) There has been an increase in the number of students attending the centres in the first year. The number of applicants for the second year has increased markedly.

b) In some centres there was a significant increase in rate of learning. At the Eskimo Point centre the average T.A.B.E. increase per training day using Plato, was 4 times that of students in the year previous. Overall the greatest gains were in Mathematics.

c) Job readiness skills included academics, Job Search and Life Skills programmes in Plato. Most students are using word-processing packages and many are using business applications software.

d) The chances of getting employment have increased not only

because the students have new skills, but also because of the
the perception of employer of a student who can use a
computer.

e) The computer system provides a student centred mode of
learning. For the full-time Academic Upgrading student, the
portion of time that he/she is spending on the computer is
self-directed learning. The learner is evaluated objectively
by the system rather than subjectively by an instructor. For
the part-time learners, be they apprentices, work release
people or workers, we now have a mechanism for providing
academic upgrading, computer literacy and business
applications in a flexible, on demand basis.

The report looks at the rationale for the project, the
implementation, and the results. It presents qualitative
data, anecdotal material, viewpoints of students, adult
educators and management. It outlines the processes of the
planning for Yr.I, the implementation and evaluation of those
plans, year II planning and implementation and all formative
and summative evaluations in Yr. II.

Patrick Fahy, Ph.D. has written a statistical analysis of
the first year, and is in the process of writing the final
report. These reports will be available from Arctic
College, Keewatin Campus, Rankin Inlet.

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INTRODUCTION

This is a descriptive report of a 2 year Computer Assisted Learning Project that has taken place in the Keewatin Region from May 15th, 1987 to May 14th, 1989.

This project was sponsored by the Keewatin Regional Education Authority (KREA) and funded as a pilot project by Employment and Immigration Canada (EIC) Innovations Program and The Department of Advanced Education, Keewatin Region. Rod Taylor, Superintendent of Advanced Education, developed the project and was the Project Manager. Heidi Wolter, Director of Programs, Keewatin Campus, Arctic College, was the Project Coordinator. Patrick Fahy, Ph.D., Director of Research and Evaluation at Alberta Vocational Centre was the independent evaluator approved by CEIC. The project has been carried out by the Adult Educators in all the communities in the Keewatin Region, with the support of their education authorities.

The purpose of this report is to describe and record the process of implementation and evaluation in a way that will provide some insight and information for anyone who wishes to replicate the project.

BACKGROUND

Adult Education in the Keewatin

There has been some form of adult education in the Keewatin Region for more than fifty years. It began at the Catholic Missions, where adults were taught to read the bible. Informal adult education has also been offered by other institutions such as the Housing Corporation.

The Department of Education set up adult education centres in three communities in the Keewatin more than ten years ago, in recent years more have been added, but it has only been since the beginning of this project (1987) that there has been an adult education centres in all of the seven communities.

The original role of the centres seemed to have been to make academic upgrading, general interest courses and career counselling available to members of the community. In the past, the centres appear to have had a fairly low profile in the communities. This role is now changing quite rapidly, as the communities begin to demand more structured approaches to instruction and the number of students begins to increase. This change is stimulated by the growth of the wage economy that requires workers to have at least a basic education in order to get and keep a job.

As the population of the communities move from a traditional based economy to a more wage based economy a demand for

different marketable skills is beginning to emerge. Students
who saw little value in education when they were in school
are finding that they need to be at least functionally
literate in English to get a job in this economy. They have
also found that they need specific training for some jobs and
that this specific training is usually only available in
English. The rate of functional illiteracy in English in the
North West Territories is about 77%. and so the Inuit
population have difficulty competing in the local job market.

What we see then is that " Jobs and training opportunities in
the Keewatin Region are frequently not being filled by local
Inuit due to their lack of prerequisite education. A large
number of Inuit are under-educated as well as unemployed in
this Region and require specialized community based
educational and skill training" [1]

Need for Change

It became necessary to examine our approach to adult
education and to find a way to serve more of this target
population. One of the reasons why we had not reached this
population is that the people were in small communities and
the numbers were not enough to support a large education
centre that provided specialized training. We could not
centralize these programs in one large community because the
students do not want to leave their communities. The
question then arises of how do we provide a broader base of
education and training at the community level.

At the community level, another reason we had not met the
needs of our target population was to be that the
traditional approach to instruction had not attracted many
students. The next question we must ask ourselves at this
point, is what instructional approach would attract more
students?

Once the need for change was established, we had to determine
how the change would be accomplished. We first had to define
our goals for the future of adult education in the Region. We
then had to develop a strategy to achieve these goals. This
strategy would include finding new modes of instruction,
establishing the process of putting the new mode into place
and finding the financial resources to carry it out.

PROJECT DESCRIPTION

Iniation of Proposal

The Employment and Immigration Canada (CEIC) Innovations
Program is set up to fund innovative approaches to training.
When the Innovation Program was made accessible to us, we
decided that it would provide an ideal opportunity to find
out if other modes of instruction and other teaching

methodologies would be more appropriate and successful with our target population.

With the knowledge that this funding was available, Rod Taylor, Assistant Superintendent for the G.N.W.T. Department of Education began to develop a proposal for a two year pilot project. He established the goals for the project, obtained support and sponsorship from the Keewatin Regional Education Authority and applied for an Innovations program grant.

Funding

The Innovations Program approved funding for this project in the amount of $1,285,000.00 over two years. This amount included funding for Computer hardware, computer furniture, software, educational courseware, software development for Inuktitut instruction, instructor support, and administrative support. This funding also included the costs of contracting an external evaluator.

The Department of Education in the Keewatin Region agreed to provide an equivalent dollar amount over the same two year period in the form of person years and the related costs i.e. time of adult educators, project coordinator, project manager and support staff and their travel costs. They also provided the facilities and program operation and maintenance costs.

Project goals.

The project design was based on the goals stated below.

1. To improve and expand, through the implementation of Computer Assisted Learning (CAL), academic upgrading, job readiness and special skill training for adults in the Keewatin Region. To respond to the special needs of unemployed Inuit who were not reached in the past by traditional training methods.

2. To provide specialized skills training to unemployed Inuit and other members of the community that is not usually available in small communities. Special attention will be paid to areas of training where local employment is available.

Objectives.

The main objective of this project is to conduct a pilot project in Computer Assisted Learning that will allow:

a) adults who have not succeeded in traditional education programs to work independently at their own level and receive regular constructive feedback; and

b) adults requiring specialized training to get it in their
community and improve their chances of either getting
employment or raising their level of employment.

CHRONOLOGY OF PROJECT IMPLEMENTATION

The following section will describe the activities involved
in the implementation process and the events that occurred
in carrying out the project. It will be presented in
chronological order.

Selecting equipment.

In February of 1987, the adult educators from all the
Keewatin Communities met with the Project Manager in Rankin
Inlet. A needs assessment was completed and decisions were
made on what the programs should consist of, what software
would be required and what hardware would be needed to
support the software. Representatives from Control Data
Corporation attended this meeting and introduced the Plato
System.

With the information provided from the February meeting, the
Project Manager (Rod Taylor) wrote an Invitation to Tender
and followed the required procedures. From the tenders
submitted, it was decided that Control Data Corporation would
be contracted as the major supplier.

Control Data Corporation (CDC) was awarded the contract for
hardware, Plato courseware, installation, training, support
and furniture. The decision was based on the fact that the
Plato courseware that CDC offered was self-contained, fully
managed and the most comprehensive available. The hardware
is a Local Area Network (LAN) system that includes a
Fileserver, with interconnected workstations. These
workstations have either single or dual disk-drives and
monochrome monitors. Some monitors have ordinary screens
and other have the touch-screen monitors needed for the Basic
Skills courseware. Mouse controls are used with some
monitors. The furniture consists of carrals, printer tables
and secretarial chairs. (A detailed description of the
LAN and courseware is attached).

We decided to use one major vendor because it was most cost
effective. It was important too, that the vendor we chose
had a track record of succesful installations at other sites
and for providing `after-sales'service and support.

External evaluator.

One of the conditions of the funding was that an independent
evaluator would be contracted to monitor the project on an

ongoing basis. Patrick Fahy, Ph.D., Director, Research and Evaulation, Alberta Vocational Centre   was approved by CEIC as the independent evaluator. The major purpose of this evaluation was to collect the data that would show how effectively the Proponent met the objectives of the project.

Centre Preparation

In July 1987, as promised by the vendor, the equipment and materials were delivered to the Adult Education Centres in each of the seven Keewatin communities.

While the tendering and purchasing process was going on, we began to insure that we had all the resources in place so that the centres prepared for the the implementation of the system. In preparation, new centres were being set up and staff was being hired. A project coordinator was hired and adult educators were hired to fill vacancies in five of the seven communities. Term and casual instructors were also hired for the beginning of the fall program.

There had been no adult educator in Whale Cove at all and only intermittently in Chesterfield Inlet. A building was acquired in Whale Cove to become both an adult education centre and an apartment for the Adult Educator. A building did exist in Chesterfield Inlet, but housing had to be acquired. All the centres had their electrical systems examined and rewired to take the additional power requirements of the computers.

CDC Training

In August, 1987 the Adult Educators, the Coordinator of Continuing Education (Project Coordinator) and the Assistant Superintendent of Advanced Education (Project Manager) met in Rankin to undertake nine (9) days training on the CAL system. The training was provided by two representatives from CDC. The training included instruction on how to install and use the hardware in their communities and how to use and instruct the students in the Plato program.

Dr. Fahy attended this August meeting to set the criteria for his evaluation, present his methodology and show the group members how to administer the evaluation measurement instruments.

In September 1987 the Adult Educators returned to their communities to install the equipment and begin their Adult Upgrading Programs. The Adult Educators had a support system of the Project Manager, the Project Coordinator and a 1-800 telephone Hot-line to the trainers and technician at The Control Data Corporation. At this time electronic communication systems were set up so that the Adult educators could communicate with each other and the Regional Office by

an INET system.

At the beginning of their courses, each centre advertised and
put on an open house so that the community could see the new
system in operation. Some of the Adult Educators and students
were interviewed on the radio and television.

<u>Life</u> <u>and</u> <u>Job</u> <u>Skills</u> <u>Introduction</u>

In January 1988, another meeting was held in Rankin Inlet for
all the Adult Educators and the Advanced Education staff.
There were two objectives for this meeting. One was for CDC
to give further training. A representative from CDC
presented more courseware in Life and Job Coping Skills and
Job Search Skills and trained the group members in its use.
The second objective was for the staff and Dr. Fahy to
some formative evaluations and suggest modifications to the
programs.

<u>Tour</u> <u>of</u> <u>installations.</u>

In February 1988, a group consisting of the Project Manager,
the Coordinator, Dr. Fahy and CDC technical expert toured all
the communities. Up to this point neither Dr. Fahy nor the
CDC representative had seen the system completely implemented
in a community. By completely implemented is meant, the
hardware and the software installed, the instructors using
the training they had taken in August and the students
working on the courseware.

Dr. Fahy was interested in seeing the installation sites and
interviewing the students to collect data. The CDC technician
was also interested in seeing the installation sites and that
everything was running smoothly from a technical viewpoint.
While he was at each site, Dr. Fahy interviewed the students
individually and as a group.

<u>Year</u> <u>I</u> <u>Evaluation.</u>

In April 1988, the Adult Educators met with the Project
Manager and Coordinator in Rankin to make a qualitative
assessment of the project so far and to plan the second year
of the project. Dr. Fahy had written a preliminary report
based on the information gathered up to and during the
February trip. The assessment was based on the
implementation and use of CAL during the 1987/88
instructional year. (The discussion of this assessment is
included at a later stage in the report.)

Using a standard outline, the adult educators wrote short
reports on their perspectives of the implementation of the
CAL system. It was important to note what were the variables
in each community and how they affected the success of the

project. The comments from their reports have been incorporated in this report.

Yr II Planning.

The planning for the next year (1988/89) was to determine what additional hardware and CAL software would be purchased to supplement the existing courses or make new courses possible.

The following items were inlcuded in the plans for year II:

1. Contract for software development of Inuktitut Grammar Course, to comply with the submission and funding in the original proposal.
2. Purchase customized Inuktitut word-processing software.
3. Deliver Inuktitut literacy component of A.B.E. programs in all centres.
4. Purchase additional Plato courseware in Basic Skills (Grammar) and High School Skills (technical/vocational).
5. Purchase additional computer workstations and furniture, so that there would be ten to twelve units in each community.

All of these planned activities were carried out in the second year of the project and will be recorded chronologically.

EVALUATION YR.I

Process

In June, 1988 Dr. Fahy completed a report on the first year of the project based on qualitative and quantitative measures, anecdotal data from logs and journals kept by participants and participant interviews.

An Adult Education conference was held in August 1988. This was held to do the following:
- examine Dr. Fahy's report and do a formative evaluation of the project.
- plan any changes or adjustments that needed to be made to improve the programs based on the formative evaluation.
-determine what components of the A.B.E. Curriculum Guidelines were being met by the C.A.L. System.
-discuss what materials and resources we needed to build a total A.B.E. curriculum that could be used throughout the Keewatin.
-discuss the progress of the Inuktitut Grammar software that was being developed.

At this conference Dr. Fahy's Year One Report was examined by the participants of the conference. The report was used as a formative evaluation of the project thus far. There were several days of discussions in which each adult educator

provided input on his/her approach to the use of the system and what impact it had had on the students. Sharing this information helped each one to find the approach that would be most successful and adjust his/her own program accordingly.

Evaluation Criteria

There were three major factors to consider in this formative evaluation. These are:
1. We needed to be sure that we were using the Plato System to it optimum potential. The criteria for optimum potential involves a) the most effective amount of time for the student to be at the terminal; b) the types of software used by the students; c) the total Adult Basic Education curriculum within which we use the CAL system.
The following provides a detailed explanation of the criteria.
a) It was decided at the outset of the project that the students would spend approximately 2 x 1.1/2 hour periods per day working with the Plato System (total 3hours daily). What happened in some centres was that the students spent part of that three hours on computer applications such as wordprocessing their creative writing, book reports etc. It was decided that for year two, the Plato should be used for most of the three hours until the student had reached his/her educational goal.

b) Word processing was being used by most of the students. Some instructors had found that it actually helped students in the writing process. Other software such as typing tutorials and inuktitut font programmes were discussed. The development of Inuktitut Grammar and Inuit Cultural Program software was initiated at this meeting. One of the criteria for this development was that it must be courseware that is managed in the same way as the Plato courseware that we are now using.

c) The Department of Education for the North West Territories have Adult Basic Education Guidelines. What we had to examine was what areas of the specific skills included in those guidelines were being taught by the CAL system. We perceive the CAL system as a tool to provide part of the total curriculum. From our perspective we can now take the skills taught by CAL out of our traditional teaching mode. We would then concentrate on teaching only those skills that the CAL does not address.

In order to balance the question/answer approach used by the CAL system we are producing very active, participatory Communications and Life Skills programs, in which reading, writing, viewing and discussing in groups are emphasized.

Outcome

The outcome of this meeting was an evaluation of the total curriculum and the beginnings of a standard curriculum for the Keewatin Region. The N.W.T. Adult Basic Education Guidelines were being used, but they are only guidelines and consequently the programs each community could differ considerably. The CAL system has introduced some standardization throughout the Region and this has affected the way in which we are perceiving the education process.

During this meeting also we looked at the measurement instruments used to evaluate the system by Dr.Fahy. In consultation with the adult educators, some instruments were changed and additional Course-End Questionnaire was added that would be given to students six months after they had graduated. All of these plans were carried out and will be contained in this report in chronological order.

CAL in Context of ABE

In January 1989, another conference was held. the emphasis of this conference was to examine the use that was being made of CAL as a tool within the context of our total curriculum. We were now at the stage where we felt comfortable enough with the system, to introduce other programs. We examined what business programs were being used in each community and noted that business application software was being used in most communities successfully. All communities were using word processing software extensively. Many were delivering courses using Lotus 123, Bedford Accounting, Introduction to MSDOS.

Multiligual Scholar

At this conference we demonstrated Multi-Lingual Scholar (MLS). MLS is an Inuktitut syllabic wordprocessing package. It was sent out to all the communities and is being used extensively. It is extremely useful because almost all the offices in the communities use syllabics as documents must be produced in English and Inuktitut.

LPDS2

In addition, the Adult Educators and trainees were trained on the new file-serving system. Control Data Corporation updated our computer system by replacing the 3com3 fileservers with LPDS2. The LPDS2 is a more efficient and flexible system. The system allows the loading of Netware. This means that all the software that could only be used in a `stand alone' manner, may now be loaded onto the LPDS2 file server and can be accessed by all workstations. Additional Plato Courseware, BS Grammar and a new catalogue for BS Read

was installed on the system.

EVALUATION YR.II

Adult Educator reports

In April 1989, the final evaluation meeting was held in Rankin Inlet. Patrick Fahy Ph.D., collected statistical data and the Adult Educators prepared reports on the effects of the CAL in their communities. These reports are summarized and contained in this report. In addition to this report, Dr.Fahy will submit a Year Two report by July 31, 1989. It is hoped that these final reports will, together, provide a comprehensive account of the two year project and serve as a model for any other region or organization that is considering this kind of innovation.

CAL SYSTEM IMPLEMENTATIONS.

The communities

The Keewatin Region is made up of seven (7) communities ranging in size of populations from approximately one hundred and eighty (180) in Whale Cove to approximately one thousand, four hundred (1,400) in Rankin Inlet. The Inuit population of these communities range from 77% in Rankin Inlet to 99% in Chesterfield Inlet. These communities are geographically isolated in that they can only be reached by plane most of the year except for a short period in the summer when they can be reached by boat.

The first language is Inuktitut, of which there are many dialects. The functional literacy level in the English language is reached by about 23% of the population.

The Adult Education Centres.

There is an Adult Education Centre in each of the communities with a mandate to provide Academic Upgrading to a grade ten level for adults. The adult centres are housed in various types of locations, typically they are located in school portables, or older refurbished buildings.

All of the centres offer Academic Upgrading on a full-time basis and part-time either during the day or evening. In addition to these courses they offer a variety of other courses that include business courses, computer applications, Inuktitut, Traditional skills and general interest courses such as Firearm Safety or Photography.

The target clientele are the unemployed, but participants in the Upgrading courses also include, apprentices, in-service trainees and employees on work release programs. At least

five of the centres have had Job Entry programs running for
the past two years. The Job Entry programs include courses
in Academic Upgrading, Life and Work Skills and work
experience.

The computer systems.

In the first year,the computer system in each community
consisted of a Local Area Network of either 5 or 8 computer
terminal workstations, connected to a file server containing
courseware, a printer and a communications modem. At the
beginning of the second year the number of computers was
increased to 10-12 in each community, except for Whale Cove.
The number of students in Whale Cove and the size of the
centre does not warrant more than 6 computers.

The courseware is Plato. This is a managed package of
software that includes Basic and High School Skills CAL
materials in Reading, Writing, English Grammar, Inuktitut
Grammar, Mathematics, High School Science, Social Studies,
Life Skills and Job Search Techniques. The latter two are
supplemented with print material and videos. The Basic
Skills begin by diagnosing the students level with
Placement Tests. Once placed the student then begins the
courses at that level. A student record is automatically
kept for each course and both the student and the instructor
can monitor the student's progress.

In addition to this there is software in both English and
Inuktitut word processing, spread sheets, accounting,
database management and electronic communications. In the
second year Multi-Lingual Scholar (MLS), was added. MLS is a
word processing package that has been customized to use
Inuktitut syllabics. We have also developed an Inuktitut
grammar course, that has been piloted this year and will be
introduced in the communities in August 1989.

The projects.

In each centre the CAL system has been used for approximately
50% of the Academic Upgrading and Life Skills. It has been
used to teach word processing and business applications.

From the outset of this project the Adult Educators have been
generally enthusiastic and committed to the success of the
project. It was agreed that they would implement the
program fully and according to the training they had
received. It was also decided that each full-time student
would spend 50% of his/her day using the Plato system and
that part-time students would spend as much of their course
as possible on the system. It was also agreed that they would
use the computer system as much as possible to provide
special skills to those working in the business community so

that these clients could raise their level of employment.

From the perspective of the Coordinator, the Adult Educators
have made every effort to comply with these agreements.
They have carried out the implementation very successfully.
Overall the program had a very successful first year. At
the beginning of the second instructional year, there was a
marked increase in the number of applicants for the Academic
Upgrading programs and existing application courses.

The Problems

There have been some minor technical problems with the
equipment. These are as follows:

1. Because of the dry air, some of the touch screens on the
monitors ceased to function. This has been corrected by
installing humidifiers in the centres and using a static-
guard spray.

2. There were technical "glitches" in the courseware. This
had resulted from having the courseware loaded into a LAN
system. In other CDC sites it has been used originally on a
large central system or on floppy disks. Many of these
"glitches" have been removed. New glitches were introduced
with the change to the LPDS2 system, but "fixes" were sent
to alleviate them. The new LPDS2 has been found to be a
much superior system to the 3Com3 fileserver.

3. Not being a computer expert and being in an isolated
community has presented some difficulties for some Adult
Educators. If something happened to suspend the use of one of
the terminals, they found it frustrating if they did not get
an immediate response from the Hot-Line number. However they
have been patient and managed to overcome this frustration.
By the end of the second year almost all the Adult Educators
have become very proficient in "trouble-shooting" with either
software or hardware.

4. Some of the centres felt that they did not have enough
computers to meet the student's demands in the first year,
consequently more were installed in the second year.

Adult Educators' Perspectives.

In discussions with the Adult Educators it was found that
they perceived the project to be a success. They were pleased
with the impact that the Innovations project had on their
students and their centres as a whole. We had the same Adult
Educators on staff for the two years of the project and they
are very enthusiastic about the possibilities of the system
for the future. They have stated that they wouldn't want to
be without the computers now and that in working with them
for the past two years they have only begun to exploit all

the possibilities.

The students liked working with the computers. They were able to work independently and develop additional skills such as computer literacy and word processing. The students were able to set their own goals for achievement and get feedback from the instructors on a regular basis. They did this by meeting with an instructor and calling up their own records from the computer. With the information from their records, they were able to see how much they had achieved that week and in what areas they needed extra help. The student was in control of his/her own pace of learning.

The students perceived themselves differently because they were able to use computers. The centres were able to attract students who would not have gone to the centre to participate in a traditional program, perhaps because they had been unsuccessful in them before.

The centre is now perceived in a different way because of the Innovations project. Many of the community business organizations, in both the public and the private sector are installing computers and are either seeking employees from the centres or sending their employees there for training. The centres are also getting requests from employed people who want to upgrade their skills.

From this information one can state that the main objective of this project is being met. That objective being " to conduct a pilot project in Computer Assisted Learning that will allow:
a) adults who have not succeeded in traditional education programs to work independently at their own level
and receive regular constructive feedback;
and b) adults requiring specialized to get it in their community and improve their chances or either getting employment or raising their level of employment. "

ANTICIPATED RESULTS.

The `Anticipated Results' on the original proposal for the Innovations Project are as follows:

a) Attracting and maintaining interest of a greater segment of the target population in educational programs.
b) Producing faster progress in academic training
c) Providing job readiness skills.
d) Increasing chances of getting employment or improving level of employment.
e) The creation of a new more effective educational model for Inuit students that may be used throughout the Arctic.

This report is not meant to be of a statistical nature. Dr.

Fahy the independent evaluator has been collecting
statistical and anecdotal data since September 1987 and has
issued two reports. The first one was a preliminary report
based on the data collected up to February 1988. The second
was a final report for the first year presenting a
statistical analysis of the data collected up to April 1,
1988.   The third and final report will be completed on July,
31, 1989 and will present the statistical analysis of the
data collected up to April 1, 1989.

From the raw data we have and questions posed to the adult
educators we were able to show that we were indeed getting
the results we anticipated. Those `anticipated results' are
stated in the form of objectives and a qualitative evaluation
of how they were met is recorded here. The quantitative data
is recorded in the <u>Year</u> <u>Two</u> <u>Report</u> by Patrick Fahy Ph.D

OBJECTIVE A: ATTRACTING AND MAINTAINING INTEREST OF A GREATER
SEGMENT OF THE TARGET POPULATION IN EDUCATION PROGRAMS.

In order to establish this data from 1987/89 instructional
years they must be compared with that of previous years.
This statistical analysis is available in Dr. Fahy's report.
From the raw data and the information gathered from the adult
educators we are able to state the following:

1. There was an increase in the number of adults
participating in adult education programs in the first year
of this project and second year shows a marked increase.

In Eskimo Point they were successful in attracting a large
number of adults students (218) this year, surpassing the
1987/88 figures. They had a significant number of return
students as well as new entrants. The computers have allowed
more flexible programming thus enticing a wider variety
of learners.

In Baker Lake there was a dramatic increase in the number of
students over the 1987/88 enrollment. People with reading
levels ranging from grade 2 to grade 12 participated in the
program. As sponsorship has always been an important factor
in students enrolling, it was most unusual to find that
unsponsored outnumbered sponsored (CEIC) students by a ratio
of 2 to 1. For the first time in the history of the Centre,
a course for very low level students was sustained for six
months. In Rankin Inlet student enrollment has increased
from a total of 63 in 1986/87 to 126 in 1987/88 and 190 in
1988/89.

2. Students in almost all the centres have stated that they
were attracted to the Adult Education Centre courses by the
computers

3.   Many new students in Baker Lake said they were attracted
to the Adult Centre this year by the computers. Working
people who had computers in their work places were attracted
to evening courses. It appears that a new and more varied
clientele participated in centre programs last year and this
trend continued this year.

4. Students whom had been unsuccessful in completing a year
of Academic Upgrading before had completed the year because
of the computers.

5. There was a different type of student attracted to the
Adult Education Centres. These students appeared to be
highly motivated, had more clearly defined career goals and
preferred to work independently.

6. There were many more part-time students who were
interested in improving their job possibilities. Because of
the availability of computers, working people could come in
and work on their academic skills, or attend the computer
literacy courses that were now being offered.

7. As computers are now available, more courses were put on
to meet the needs of the business communities. Computer
Literacy, Word processing in English and Inuktitut,
Accounting, Spread Sheets and Database Management courses
were made available at many of the centres. It is expected
that the numbers of courses will increase with demand.

OBJECTIVE B:PRODUCING FASTER PROGRESS IN ACADEMIC TRAINING.

1. Preliminary comparisons of T.A.B.E. results of students
from 1986/1987 academic year with the 1987/88 & 1988/89
academic years indicate that there was an increase in
progress in some centres. However, from the statistical data
available we find that it is not significant. It must be
noted that the T.A.B.E. used does not test writing ability
and is very limited in the testing of reading ability.

2. At the Eskimo Point Centre it was found that their average
T.A.B.E. increase per training day in the first year was 4
times that of the students of the previous year.

3. It was found that the greatest increase was for students
at the higher levels, i.e. students who's entrance T.A.B.E.
was 7.0 or more made greater gains than those below 7.0.

4. Using raw data, some centres found that the T.A.B.E. gain
was not apparently greater than the previous year.

5. Most Adult Educators agreed that the greatest gains were
made in Mathematics.

6. It must be noted that students who have used Plato solely to pass the GED 12 exam have stated that it helped them prepare. Of the 4 students, in Coral Harbor, who studied and took the exam, three passed. It is interesting to note the three that passed used Plato to do this.

7. There was rapid progress through the Plato courseware. For example in after six months most Baker Lake students had completed several High School (GED) courses. Completion of the courses produced great feelings of accomplishment in students. This carried over to increased confidence and progress in their other courses.

OBJECTIVE C: PROVIDING JOB READINESS SKILLS

1. As stated by the Adult Educator in Eskimo Point, job readiness skills form an integral part of our program. More specialized skills were offered this year and they were well received. Classroom lifeskill components were supplemented by PLATO lessons, particularly in areas of resume writing and job search skills. Many students are using the computers to create letters of application and resumes. Some of these are students whom have finished their courses come back and use the information stored on their disks.

2.   One of the major outcomes of this project is that the students are using computers. There is a general perception that those who are able to use computers are in some way smarter than those who cannot. This perception has worked well for the students. The students are perceived differently by the business community and they perceive themselves differently. Therefore, just having the exposure to the computers has enhanced their job readiness.

3. The Academic Upgrading students have learned word-processing and use it to do their writing assignments. This has given them a marketable skill and the confidence of knowing that they do have a skill that is in demand and becomes more in demand as the local employers are incorporating computers into their operations.

4. Computer Literacy, word processing in two languages and the definitive academic content of the Plato system has certainly enhanced their resumes.

5. The Job Search and Life Skills programs that the system has made possible, has given students the leading edge over other members of the community when applying for jobs. The Adult Education students have been taught to use a systematic approach to job seeking. They have also examined their own work behavior and developed the knowledge and confidence to present themselves well at interviews.

6. Many social skills that cannot be measured objectively have enhanced the employability of the students. These include a greater degree of confidence from working with technology and a recognition of themselves as adult learners from working independently.

OBJECTIVE D: INCREASING CHANCES OF GETTING EMPLOYMENT OR IMPROVING LEVEL OF EMPLOYMENT

The following are the Adult Educators observations.

1. In response to the computers. the perception of the business community has become such that they approach the Adult Educators to recommend potential employees.

2. In Chesterfield Inlet, one student was asked to become a classroom assistant after graduation and the Adult Educator felt that this would not have happened if the student had not become computer literate.

3.In Repulse Bay local businesses are bringing work into the centre for students to do on the computers. This reflects positive impressions of the business community and can only give the student the kind of exposure that leads to employment after completion of his/her course.

4. In Coral Harbour, community employers have contacted the Adult Education Centre personally, to have specific students apply for jobs. Employers have employees participating in Academic Upgrading on a work release basis. The demand for this has been greater in the past two years, than in previous years.

5.In Rankin Inlet, as with other centres, they found it easier to accommodate government trainees and apprentices who need to upgrade their academic skills for their present positions. Previously they had been incorporated into an existing classroom situation or set up with individualized programs. It was often difficult to place them or provide the appropriate materials for their specific needs. The computers and Plato system has made it possible for these individuals and for the instructors to set up a more flexible program in terms of course content and time schedules. The Plato system is such that it diagnoses the students academic level in basic skills and the student can work independently in specific academic areas.(e.g. if a student is weak in math, he/she may work only in that area).

6. Eskimo Point staff have found that they are able to deliver educational services to more people because of the computer system. They state that it is likely that they would not be able to offer the number of skills or trades

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courses they do without CAL given the financial and time constraints under which they operate. By the nature of the programs the Centres can now offer, the students chances of obtaining or improving the level of employment are much enhanced. The Plato system has been successful in attracting people who are working and need additional skills, but have only a limited time to spend.

7. As the Adult Educator in Eskimo Point has stated. " The centre is being perceived as producing a credible product. Many employers have phoned to inquire if students are available for work, especially if they have office skills. A number of students have decided the leave the program and accept jobs.

8. Another benefit of the computers is the ability to provide a resume service for the community. Anyone can use the wordprocessing software to produce a high quality resume, with limited supervision. This is an extremely important service because many find it extremely difficult to complete a resume and not having one is a barrier to seeking employment.

OBJECTIVE E: CREATION OF A NEW, MORE EFFECTIVE EDUCATIONAL MODEL FOR INUIT STUDENTS THAT MAY BE USED THROUGHOUT THE ARCTIC.

1. Through the implementation of this project, we have created a more effective model of adult education and training. We are now able to reach students in sparsely populated, isolated communities. The model provides an integrated system that allows us to overcome the barriers to learning that exist in this environment. These barriers may be those of the traditional methods of education that have not been very successful, the lack of financial and human resources to offer flexible individualized and specialized training in isolated communities and the inability to communicate information efficiently with communities where there is no road access and severe weather conditions.

2. The Innovations Computer Assisted Learning Project provides computer hardware and the software for Academic Upgrading, Life Skills, Job Search Skills, Communications and Business Applications. The program is a learner centred, comprehensive computer-based learning tool. The concept in itself, is a new educational model, but what is important is that it is fully operational in seven communities and the regional office.

3. We have now something that we have not had before in the Region and that is a standardized core curriculum. A student may move from one community to another and begin exactly

where he/she left off in the other community. The student may
take personal information and course work with them on their
own disks.

4. With the electronic communications, each adult educator is
able to keep in touch with each other and their supervisor on
a daily basis. They are able to send files, curriculum
materials etc., to each other within minutes .

5. With both of these factors in operation (2 & 3 above) we
are developing a cohesive and accountable educational model.

6. Within the larger new model of the system, we have the new
model for learning for the student and instructor. For the
student there is an independent learning experience. For the
full-time Academic Upgrading student, the portion of time
that he/she is spending on the computer is self-directed
learning. The learner is evaluated objectively by the system
rather than subjectively by an instructor.

7. For the part-time learners, be they apprentices, work
release people or workers, we now have a mechanism for
providing academic upgrading, computer literacy and business
applications in a flexible, on demand basis.

8. Bringing these factors together show that this system is
the beginning of the creating of a new, more effective
educational model. As it has been successfully implemented in
the Keewatin over the past two years, there appears to be no
reason why it cannot be used as a standardized model
for throughout the Arctic.

9. Those who have been trained and have implemented the
system have gained expertise that can be used by and passed
on to other regions that wish to implement the system.

10. Finally, the Adult Educator from Baker Lake sums it up,
by stating: with a core ABE curriculum, more client based
instruction, attraction of more people and a wider range of
programming, the Keewatin is providing a model of effective
community-based education.

GENERAL PERSPECTIVES

Much of what has been written here in the section on
anticipated outcomes has been taken from short reports
written by the adult educators. They each responded to all
the objectives for their respective communities. In
concluding their reports they made the following comments.

a) An increased number of specific skill development programs
have been offered without having to rely upon expensive
imported expertise for delivery.

b) The increased confidence in many students can only enhance their attributes for future employment and educational growth.
c) The success of the CAL project has raised the profile of Adult Education in my community (Baker Lake) to unprecedented levels.

CONSIDERATIONS

The Adult Education Situation

In contemplating installing CAL in any situation there are many factors that must be considered. The first consideration is why one would want to do it.

In our case the reasons for installing CAL were to meet the goals and objectives already stated in a manner that we had not been able to before.

In all communities we have an adult educator. In many of those communities the adult educator is the only person with instructor qualifications. However, the Adult Educators' duties include, community development, staff hiring and supervision, curriculum development, public relations, student counselling, administration and programme development and delivery. In some instances this also includes the training of an adult educator trainee.

In terms of programs, there is least one full time Academic Upgrading program, i.e. six hours per day, five days per week, and one part time program offered in the small communities during the instructional year. In the larger communities additional courses are offered when there is a demand and instructional staff are available.

The consequences of this situation were as follows:
- the adult educator was unable to teach classes in the traditional way for six hours a day and carry out all of his/her other duties successfully.
- the number of students and programs were limited by the number of qualified instructors available.
- the subject content was limited by the adult educators knowledge. i.e. the adult educators do not have expertise in all the subjects the students may wish to learn.
- there was inconsistency with the programmes. Adult educators brought with them their own instructional methodology and consequently used materials that fit that methodology.

Reasons for CAL

The reasons one would consider Computer Assisted Learning (CAL) are as follows:

- the CAL system is consistent. The software includes a core programme in Mathematics and English up to Grade 10. (This is only some of the courseware we use. The other courseware is listed in the appropriate section) This means that all the communities have the same course content for at least these core programmes.
- the Cal system teaches subject matter in the same format for all subjects. It also deals with subjects in which the instructor may not have much background e.g. Calculus.
- it expands the range of courses that can be offered. We can now offer high school courses to part-time students who simply wish to take one subject at a time.
- it allows the student to move at his/her own pace. The courseware is structured so that the student takes a placement test and begins learning at the place that is appropriate for that specific student. Lessons are divided into tutorial, drill and test segments so that the student can challenge the test and need not complete the lesson if he/she is proficient in that area. The students can progress at a greater speed if they are only learning what they don't know.
- it allows the students to control their own learning. The courseware management software keeps records of the students progress and the instructor and the student can review these records on a weekly basis. This process is valuable because the CAL system shows the students how much they have accomplished that week, how well they scored and in what areas they need additional tutoring. - it is objective. The student/computer interface provides objective evaluation. The scores on tests reflects the students abilities consistently. Student/instructor relationships can often affect the progress that the student makes. In cases where this is a negative relationship, the student's progress can be impeded by a subjective evaluation.
- it allows the student exposure to subjects in which the instructor has little expertise and thus the student would not get the exposure in another way.
- it allows the instructor time to assist students individually.

Reasons for PLATO

The second factor to consider is why we chose the PLATO System.

The research for this project began in late 1985. When the decision was made to implement CAL, a search for appropriate software began. A systematic search across Canada was done to find out what software was being used elsewhere that would be suitable for the adult educations centres in the Keewatin. After consultation with vendors and users of educational software. Plato was found to be the most suitable.

The Plato System (Programmed Logic for Automatic Teaching

Operations) was developed originally in 1959 as a joint
project between Control Data Corporation and Donald Blitzer
at the University of Illinois (Pagliaro, 1983). Since then of
course it has been constantly updated and adapted for use on
a local area network system. The courseware continues to be
updated to meet the Canadian market.

The Project Manager and an adult educator contacted
institutions in British Columbia and Ontario, where the Plato
system was being used. All the institutions contacted
recommended it. Further investigation found that there was no
other system that was as comprehensive. Not only did it
include courseware that covered from Grade 3- 10, it was a
completely managed system that included diagnostic tests and
student record keeping.

Plato is a managed package of software that includes Basic
and High School Skills CAL materials in Reading, Writing,
Mathematics, Social Studies, High School Science, Life Skills
and Job Search Techniques. The latter two are supplemented
with print material and videos.

The Basic Skills begin by diagnosing the students level with
Placement Tests. Once placed the student then begins the
courses at that level. A student record is automatically
kept for each course and both the student and the instructor
can monitor the student's progress.

It is important to have a system with diagnostic and
management components. Reading diagnosis is a particularly
difficult and time consuming exercise. In order to do it
properly, an adult educator must have specialized training in
the reading process. Unfortunately this is an area that is
not emphasized in teacher training programmes and many
instructors do not feel confident in this area. Consequently
the student can be functioning at frustration level with
material that is too difficult or not progressing quickly
enough because the material he/she is reading is not
challenging. It seems to be more difficult to diagnose the
reading level of adults. Adults bring with them such wealth
of experiences that affect their approach to learning. The
Plato programme is designed for adults by teams of experts.
Consequently the diagnosis is more accurate.

From the instructors viewpoint, it saves time and energy
searching for the appropriate diagnostic material and they
feel confident about the level at which the student is
starting. I believe that it is easier to diagnose the level a
student would be at in mathematics, but even in this case it
is better to have expert diagnosis.

The management component of this system is really valuable.
Student records are automatically kept for every course for
every student. The instructor can call up the student's

record to monitor the his/her progress. As mentioned earlier, the weekly meeting in itself, is a valuable process but as well as this an accurate record is being kept that the students can take with them should they move to another centre. It saves a lot of time for the instructor because there is no need to mark papers or keep cumulative records.

Success Factors

The third factor to consider is how can we ensure that it will be successful. The most important variable in the success of this project is that the people involved are committed to it. The implementation of any new system or methodology means change. In the literature of Industrial Sociology and Psychology there has been a lot of attention paid to employees resistance to change. The literature on automation in the work place provides examples of employees' behaviors that are indicators of resistance to change. The introduction of computers is the introduction of automation. It is important that the manager of the project is aware of these indicators so that problems can be anticipated and prevented. It is important too, that when problems do arise that one can determine what is really happening and solve the problems quickly.

In the final analysis, it is the attitudes of those working on the project that will determine the success of the project. It is important that the managers of the project know how the employee feels before the project starts. If the person has no commitment to the project then minor setbacks will become major ones. For example, the person with the commitment will perceive a 'glitch' in the program to be annoying perhaps, but will see that in the context of the whole project it is a minor problem. However the person who feels negative towards the project will see the project in the context of this 'glitch' and it is a major problem. It is important then, that we know the employees perception of the project before we start so that it can be dealt with.

People have very valid reasons for feeling negative. It may be that they have had no control over the new environment in which they have to work. It may be that they feel the computer will replace them. Whatever the reason, it is best to know that this exists.

With the Adult Educators we made every effort to avoid this by involving them in the process from the beginning. For almost a year before the CAL system was implemented, the Adult Educators were consulted and at the conference in February 1987 they took part in the decision of what learning system to buy and in developing the criteria to evaluate the project. They met as a group three times during the first year and again met three times during the second year of the project to report on how it worked at their particular

centres. They worked closely with the external evaluator Dr. Fahy and helped to redesign and refine his evaluation instruments. They wrote individual reports and used these to do formative evaluations upon which they would base their programs the second year.

The Adult Educators built their commitment to the project by investing so much of their time and expertise as a group. Although there were specific expectations from the managers of the group, the adult educators were able to accurately assess the reality of those expectations because they were out in the field and knew the students and the circumstances.

As with all employees faced with some form of automation, I expect that there was some thought given to the computer replacing the instructor. I believe that they thought that at least their role would change. Neither of these things have happened. The CAL system has taken away some aspects of teaching. Much of the diagnosis and marking has been taken away. The constant contact with all the students is not there either, as they spend half of their day on the computer. Because the students do not need constant attention, the instructor has more time to work with each on an individual basis. The CAL system is only a tool to help the instructor be more effective. It is a desirable way for students to learn and so it is increasing the numbers of applicants. Therefore more instructors will be needed in the near future, not less.

The Adult Educator's role has not changed significantly. The student has become more responsible for his/her own learning, but the direction must come from the instructor. Their teaching styles are changing because the Department's expectations of non-computer time is that it is spent in a more active learning style.

Training

The training plays a critical role in helping people adapt to new systems. It was particularly critical in this case because the Adult Educators had to go back to their communities and cope with this new technology knowing that the only further instructions they would be likely to get would be a voice on the telephone. They were solely responsible for installing their computer equipment. They had to be able to make back-up tapes on a weekly basis. They also had to know how to use the courseware and to instruct the students to use it. This is quite an intimidating feat.

Some of the Adult Educators had used computers before and were fairly comfortable with the tasks involved. Some of them had had no experience with computers and felt quite overwhelmed at the beginning. The latter experience is likely to make the participant feel that they have no control over

their environment and this is why proper training is crucial.

From my perspective I think the training was done well. The system was set up in the Rankin Adult Education Centre and the Adult Educators came in to take the training. The first two days were devoted to equipment installation. It was hands-on and by the end of the two days, everyone had connected up the LAN system and done a tape back-up.

The next seven days were devoted to the courseware. The participants were taught how to use the courseware. This included how to do placement tests, lessons and units and how to register students and keep track of students' progress. The trainees worked very hard during this time. They took the training during the day and the two trainers came back in the evening to give additional practice to those who wanted it. The trainees became a very cohesive group and helped each other.

When the Adult Educators went back to their communities, they had a "hotline" that they could call if they needed help. In many instances, they would call each other or the coordinator of the project if something was not working properly or they had forgotten a procedure. In retrospect, their have been no major problems. The centres had their systems up and running in time to start their courses. The Adult Educators did quite a remarkable job.

The timing of the training could have been much better. More time should have been allocated between the time the Adult Educators were trained and the instructional year began. The training was done in August and the instructional year begins in September. It would have been much better to have done the training in May, allow the Adult Educators and instructors to become familiar with the system, pilot test it with a few students and have the 'glitches' dealt with before the busy fall term started. It would have been profitable for all instructors to have a user group meeting/training session in August so that they would be able to use the full potential of the equipment.

Unfortunately because of the time constraints of the project, we were unable to arrange the training differently. We began the project in Mid May and were unable to get the equipment delivered until the end of July. The vendors (CDC) delivered the equipment to all the communities on time. However because of the size and the complexity of the order and the distances from the vendor to the communites, we got the earliest delivery date possible.

PUBLICITY

Once the project was underway and we all felt confident enough to provide useful information to others, we made every

effort to publicize the project. We developed a promotional
strategy and began to disseminate information by the
following means:
- interviews by the local radio and television stations.
- articles written in the newspapers in the NWT.
- articles in "Dialogue", the College 'inhouse' publication.
- reports written by Heidi Wolter and Patrick Fahy have been
distributed to all departments from the Ministry down.
- both above reports have been sent to the E.R.I.C data base.
- a presentation was made at the "Sixth Symposium of
Instructional Technology"
- Control Data Corporation has written articles and sent
publicity across Canada and the United States.
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FINAL ANECDOTAL EVALUATION

At our conference in April 1989, we were doing the final
evaluation on the project. The adult educators had brought
their statistical information with them to give to Dr. Fahy,
to take back to analyze.

I was interested in getting a more in-depth view of the of
the project from the perspective of the adult educators and
trainees. In order to get spontaneous responses I started
several sentences and asked each member of the group to
finish them.
The first sentence was " Because of Plato..." These were the
responses:
Because of Plato...
-students are moving faster and learning more.
-I never hear the students say "I'm bored"
-I have more contact with the student, because I have more
time for individuals.
-there is more focus for professional attitudes to emerge.
-we have become a team. (The project has been a team
builder)
-we have easy access to communication, and information (data
banks). It has revolutionized the way we do business.
-we are doing more networking with those outside of our
region. Sometimes out of intellectual curiosity, sometimes
out of the demands of the project.
-we have a sense of being in the forefront "skunkwork"
-we are perceived as "techies" and are asked for help by
computer users in the community.
-we have a been given the edge in the competition for
funding.
-our workload has increased
-we are growing with the technology.
-we have a sense of professional pride about our centres, we

enjoy `showing off' to visitors.
-our profile has changed. (That of the Adult Education
Centres).
-we are risk-taking with the newer technology
-it has changed my teaching style
-more Lifeskills materials have been incorporated in my
course.
-the students are now keeping resumes on file and
shocking the local employers with well written applications.
-the local employers are now expecting resumes from
applicants.
-the students have more control
-there is no discrimination between levels of students. They
all go on the computer at there own level.
-the students request more varied courses because they know
we have them available.
-students are more willing to risk learning
-students are more confident
-students 'hangout' at centre. (there is a video arcade
affect after hours)
-are interacting less, sneak out of meeting to get back to
the computer.
-students have no cultural barriers to learning
-this media is quite congruent with native learning style.

This is how the group member responded to "If I ran the
project I would...
-give more time for training. (The training should have been
done in May not August, so that the instructors had more time
to `play' with the system before the students arrived).
-develop a model for the implementation
- give a broad fundamental DOS training so that the educators
would not be intimidated by glitches.
-invest more in training so that educator would not waste the
potential of the equipment.
-use trainers who were "technical morons" i.e. more at the
level of the new user without the technical jargon.
- orient the stakeholders in the community by demonstrating
the equipment before the students arrive.
- secure commitment at all levels

The following are the responses to the sentence "I was
disappointed by..."
- the glitches, due to being the first to use the courseware
on a LAN system.
- not starting off with the superior LPDS2 system, but the
3com3 and then having to change to the LPDS at such a
late date. (January 1989).
- the students having to deal with the glitches.
- the turn around time for service from CDC on "Hot Line"
  calls.
- the shortage of time to familiarize myself to the
courseware and equipment.
- the shortage of time to develop supplementary materials.

What were my satisfactions? " I am satisfied with...
- the students' acceptance of that mode of learning.
- the community service affects.
- that we now have a core program,
- that we can now offer special programs
- the students responses- their confidence, success,
completion rate, the way in which their achievements are
encouraging other growth.
- the enhanced interest in the Adult Education Centres.
- the fact that technological transfer is optimum.
- the balance between computer and traditional instruction.
- the improved communication between and the sharing among
Adult Educators.
- that I have enhanced my personal expertise in CAL.
- that we are the leaders in this field in the NWT.
-that we have Regional autonomy for quality programming.

EXPECTATIONS FOR THE FUTURE

After two years of working with the system, the Adult
Educators have become really proficient with the hardware and
many different kinds of software. They look forward to next
year being the next phase in this process.

Affect of expert base

They see the following as natural outcomes of the base of
expertise we have developed this year:
a) The spectrum of software/courseware will be increased to
allow programs from basic literacy to High-school GED.
b) More local special skills programs will be requested.
c) We will have systematized the Plato support materials.
d) We will continue to collect and analyse data.
e) We will be authoring courseware ourselves to meet
specialized needs.
f) We will be using the LPDS2 more efficiently than we are at
the moment. This is that we will be loading more programmes
and using them for more functions. These would include:
-recordkeeping and reporting centre data as well as student
data
- curriculum development
- technology currency
- updating information (TIPNET)
- site licensing.

Technology available

The impact of having the technology available in the
community will create the following changes.
a) The student enrolment numbers will increase further.
b) There will a strain on the budget, funding will need to be
increased. This includes the need for larger facilities to
house the growing enrolment.

c) The role of the Adult Educator will change to more of a
Community Developer/Administrator in the larger communities.
d) There will be a greater interest from the Divisional Board
to become involved in projects of this nature themselves or
in some way link up with ours.
e) The interest of other Arctic College Campuses will
continue to increase and our expertise will be sought.
f) There will be a greater support given to in adult
education issues within the region.

We do not see that there will be any movement back to only
traditional instructional modes. As one Adult Educator said
"Hey I would n't have life without it !". The staff are
committed to this way of instructing and the students expect
it.

The CAL project was transferred to Arctic College in April,
1988. This was part of the transfer of all Adult Education
from Advanced Education to Arctic College. However Rod
Taylor, has continued to manage the project until the end.
Heidi Wolter was transferred to the College and so has stayed
as the Coordinator of the project. As the CAL system is
successful, it will stay in the communities and continue to
be supported by Arctic College and the Community Adult
Education Centres.

CONCLUSIONS

We had the same staff members in the communities for the past
two years. They have experienced a lot of changes over that
time and have handled them well. They began this second year
with enthusiasm, anticipating and prepared for more changes
as new courseware was added to the existing programs. They
seem to feel that for themselves this is a valuable
experience and has added to their professional growth and
expertise. I believe that this applies to myself, as the
Coordinator, and to the Project Manager, who, along with the
Adult Educators has worked closely as part of the team to
carry out this project.

From the perspective of the Project Manager (Rod Taylor) and
Project Coordinator (Heidi Wolter), the Project has been
extremely successful. We had commitment at all levels. The
Adult Educators were very cooperative, patient and determined
to make the project a success. The Manager and Coordinator of
the project were both committed to the concept of CAL and to
the value of the project for adult education in this region.
The vendors (CDC) have provided good service, particularly
when one considers the distances between the vendor and the
sites. Dr. Fahy, the external evaluator, has been extremely
accomodating and helpful. He developed a strong working
relationship with all the members of the project team. He
worked closely with us all to evaluate the project. All the
phases of the project were on schedule.

It is important to note the uniqueness of this project.
Thanks to the CEIC Innovations grant, and our very hard
working team in adult education, we now have seven isolated
Inuit communities with electronic access to a vast range of
training.

This report has attempted to describe the Innovations
sponsored Computer Assisted Learning Project from the outset,
to the end of the second year. It has looked at the
rationale for the project, the implementation, and the
results. It has attempted to show a holistic picture, by
presenting qualitative data, anecdotal material, viewpoints
of students, adult educators and management.

LOCAL PLATO® DELIVERY SYSTEM

⊆⊇
CONTROL
DATA

Academic Upgrading and Employment Preparation
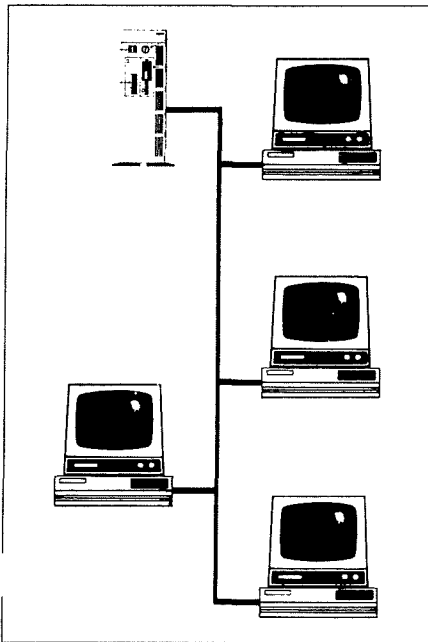
Enhanced Capabilities

The Control Data Local PLATO®
Delivery System (LPDS) provides
individualized, computer-based
instruction for people requiring
academic upgrading and
employment preparation training.

The LPDS is the most complete
academic upgrading and job search
training system available today. Its
Curriculum Manager software frees
instructors from administrative
duties, allowing more time for
student contact.

Grows With Your Needs

The system consists of a Local
Area Network which allows up to 30
learners simultaneous access to the
courseware. Students access the
courseware through the PC
compatible PLATO workstation.

The Local PLATO Delivery System
provides you with capabilities
normally associated with large and
expensive networks.

Powerfully Built-In Curriculum Manager

- The benefits for the learner
  include access to high quality
  PLATO courseware, and
  individualized, self-paced
  instruction with proven
  effectiveness. The use of
  pretesting and modular design of
  the instructional materials enable
  learners to start course work at
  the point which is most
  appropriate to their needs and
  goals.

- For instructors, the Curriculum
  Manager simplifies administrative
  tasks such as testing, scoring,
  assigning learning resources,
  record keeping and monitoring
  learners' progress.

- While students learn at individual
  workstations, the Curriculum
  Manager records their progress.
  This frees instructors to tutor
  individual students who need
  additional help.

Provides Access to DOS Applications

- The Curriculum Manager allows
  you to access a variety of
  activities, which include PLATO
  lessons, tests, DOS applications
  and Curriculum Manager options.

Components of The Local PLATO Delivery System

Comprehensive Curriculum

The following academic and
employment preparation courses
are available on the system:

• Basic Skills	Hours
Mathematics	119
Reading	187
Grammar	112

• High School Skills	
Mathematics	28
Reading	36
Writing	41
Science	42
Social Studies	40
Computer Awareness	9
Algebra	75
Geometry	45

• Advanced Math & Science	
Precalculus	120
Calculus 1	125
Calculus 2	120
Chemistry 1	90
Chemistry 2	90
Physics 1	90
Physics 2	90
Pascal	90
FORTRAN 77	95

- **Life and Work Skills (24 hours)**
  The individualized courses are
  part of a comprehensive
  employment preparation program
  including individual counselling
  and small group discussion.

  Understanding Self
  Understanding Others
  Overcoming Self-defeating
  Behaviour
  Communication Skills
  Employability Attitudes
  Customer Contact Skills

- **Job Search (25-40 hours)**
  This Control Data Job Search
  Program is designed to help
  people find jobs through a
  structured, individualized
  process. Learning activities
  include computer-assisted
  lessons, audio-visual, text and
  optional group activities.

Delivery

Learners access the system through a PLATO Workstation, with a high quality graphics monitor. keyboard and an optional touch or mouse input device.

Students take lessons or programs from their individual workstations and the fileserver manages their access to courseware. All curricula and software applications reside on the fileserver's hard disk. This provides students and administrators with easy access to courseware and record keeping capabilities.

The Local PLATO Delivery System uses industry standard software conventions. When required, each station on the system can also be used as a standalone PC by simply going "offline" and not connecting into the Local Area Network.

Consulting

Control Data Consultants support you every step of the way. From the initial planning stages through installation to ongoing operation. assistance is provided.

All of Control Data's customers have access to 1-800 hotline support.

Authoring

The optional PCD3 authoring system facilitates custom courseware development. PCD3 addresses the complete design and development process without the need to program or to work within the constraints of lesson models.

Technical Specifications

Fileserver Features:

80286 processor (8MHz) fileserver with 2.5MB RAM
200MB (formatted) hard disk storage
60MB streaming tape drive
1 monochrome monitor (No Touch)
Detachable keyboard
1.2MB floppy disk drive
LAN Controller card
Monochrome adapter with parallel printer interface
NLQ printer
Floppy/hard disk controller card
All required cables
Eight streaming tape cartridges
Surge/limited processor and memory protection
All licensed applications and accompanying documentation

The fileserver includes Novell Network software. DOS license and Curriculum Manager software. The LPDS has the capability of networking customer-owned DOS software applications (licensed for network use).
Dimensions:
25" x 11" x 30"

Learning Stations:

Base Unit:
Dual speed (8/4MHz) 8086 microprocessor (PC-compatible)
640KB RAM
One 360KB 5.25" floppy disk drive as standard
Video Board supports EGA. MGA. CGA
5 IBM PC-compatible slots
Ethernet (LAN) Card
Enhanced Keyboard (101 keys)
Serial Port
Parallel Port
Reset Button
MS-DOS. GWBASIC

Power Requirements:
115V. 60Hz

Dimensions:
13" x 15.5" x 5.5"

Monitor:

14" diagonal non-glare screen
512 x 508 resolution
Touch interface

Power Requirements:
115V. 60Hz

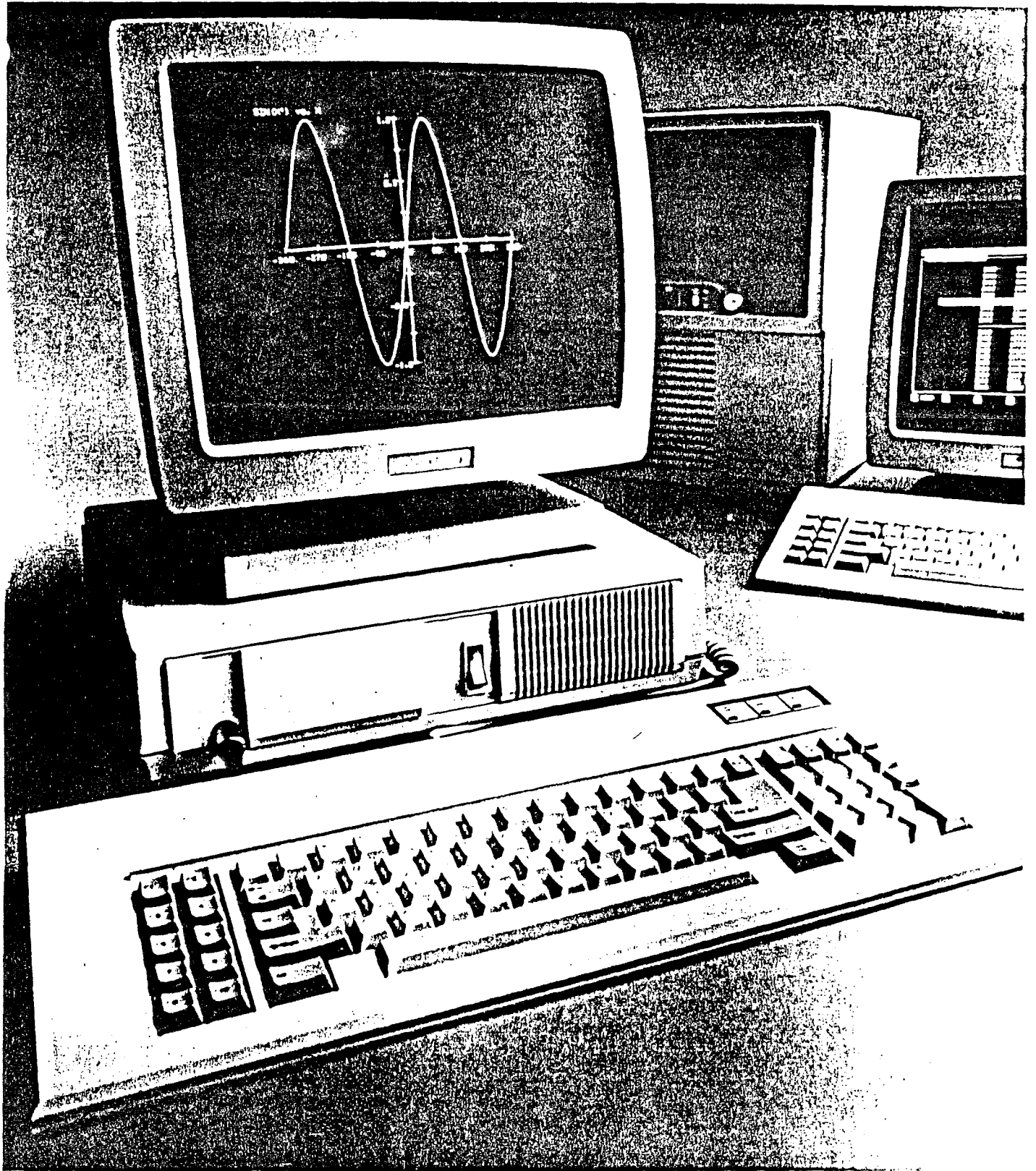Dimensions:
13" x 13" x 14.5"

Options:

Learning Station with dual disk drive
Learning Station with 20MB hard drive disk
Touch/Mouse Input

*Subject to change

For more information. contact:

Control Data Canada Ltd.
Education and Training Services Division
110 Bloor St. W., Suite 202,
Toronto, Ont.
M5S 2W7
(416) 964-8845
Fax: (416) 920-6856

The new PLATO/   ¨ Local PLATO Delivery System (LPDS) uses IBM PC-compatible technology to deliver training to more students, more efficiently. Individual workstations (front) can be used as stand-alone microcomputers to run additional computer applications. Correction educational facilities can link from 5 to 30 workstations to the new LPDS file server, which has an administration terminal (back) to access and manage the delivery of popular PLATO® courseware. Available to the corrections industry from Control Data Corrections Systems.

BILL OF MATERIALS

A. COURSEWARE

1. ACADEMIC AND EMPLOYMENT PREPARATION

A. INDIVIDUAL WORKSTATION LICENSES FOR PLATO LEARNING SYSTEM (PLS)

QTY	DESCRIPTION
45	Canadian Basic Skills Reading
45	Canadian Basic Skills Mathematics
45	Canadian High School Skills Reading
45	Canadian High School Skills Mathematics
45	Canadian High School Skills Writing
45	High School Skills Science
45	High School Skills Social Studies
45	Algebra Curriculum
45	Precalculus
45	Calculus I
45	Calculus II
45	Physics I
45	Physics II
45	Chemistry I
45	Chemistry II
45	FORTRAN
45	PASCAL
45	Understanding Self
45	Understanding Other
45	Overcoming Self-Defeating Behaviour
45	Communication Skills
45	Employability Attitudes
45	Customer Contact Skills

B. ADMINISTRATION GUIDES AND WORKBOOKS

QTY	DESCRIPTION
7	PLATO Learning System Administration Guide for Academic and Employment Preparation Curricula Includes rights to reproduction for each site

BILL OF MATERIALS

A. COURSEWARE (continued...)

1. ACADEMIC AND EMPLOYMENT PREPARATION (continued...)

B. ADMINISTRATION GUIDES AND WORKBOOKS

QTY	DESCRIPTION
7	Sets Basic Skills Reading Student Workbooks Includes rights to reproduce in each site
7	Sets Basic Skills Math Student Workbooks Includes rights to reproduce in each site

2. JOB SEARCH SKILLS

A. INDIVIDUAL WORKSTATION LICENSES FOR PLATO LEARNING SYSTEM

QTY	DESCRIPTION
45	Job Search Curriculum

B. ADMINISTRATIVE GUIDE AND WORKBOOKS

QTY	DESCRIPTION
7	JOB SEARCH ADMINISTRATORS KIT, includes: Manager Manual, Facilitator Manual, Job Developers Manual, Appendix and rights to reproduce for each site.
7	JOB SEARCH PARTICIPANT MANUAL, includes: rights to reproduce for designated site
7	SET OF JOB SEARCH FILLED FLIP SCRIPTS & REFILLS

BILL OF MATERIALS

A. COURSEWARE (continued...)

2. JOB SEARCH SKILLS (continued..)

C. AUDIO VIDEO MATERIALS

QTY	DESCRIPTION
7	Sets Of 12 Job Search Audiocassette Tapes
7	Sets Of 13 Job Search Videotapes

3. BUSINESS APPLICATION SOFTWARE PACKAGE TRAINING MATERIALS

a. STUDENT LEARNING GUIDES (includes rights to reproduce for each SITE

QTY	DESCRIPTION
7	MS-DOS Student Learning Guide
7	Lotus 1-2-3 Student Learning Guide
7	dBASE III Student Learning Guide
7	Wordstar Student Learning Guide
7	ACC PAC A/R Module Student Learning Guide

b. REFERENCE TEXTS

QTY	DESCRIPTION
7	1-2-3 Go (ADDISON WESLY)
7	Using 1-2-3 (QUE)
7	WORDSTAR Made Easy (ETTLIN)

c. COMPUTER-ASSISTED INSTRUCTION

QTY	DESCRIPTION
7	CDEX WORDSTAR Training Course

4. OFFICE PROCEDURES / COMPUTER LITERACY

QTY	DESCRIPTION
7	Generic Word Processing Student Kits
7	Generic Word Processing Learning Station Kits

BILL OF MATERIALS

A. COURSEWARE (continued...)

4. OFFICE PROCEDURES / COMPUTER LITERACY (continued...)

QTY	DESCRIPTION
7	Computers For Anyone Kit
7	Computers and Employment Kit
7	Notecalc: Fundamentals Of Spreadsheets Kit
7	Personal Computer Uses Kit
7	Computer Careers Kit

B. SOFTWARE

1. PLATO LEARNING SYSTEM MANAGEMENT SOFTWARE

QTY	DESCRIPTION
7	PLATO Cluster Software
7	RBASE SYSTEM V Database Management And Report Writer

2. LOCAL AREA NETWORK SOFTWARE

QTY	DESCRIPTION
7	Sets 3+ SHARE
7	Sets 3+ TURBOSHARE
7	Sets 3+ MAIL

3. WORKSTATION SOFTWARE

QTY	DESCRIPTION
45	PLATO User Software
45	3+ User Software

4. BUSINESS APPLICATION SOFTWARE PACKAGES

QTY	DESCRIPTION
7	LOTUS 1-2-3
7	dBASE III

BILL OF MATERIALS

B. SOFTWARE (continued. . .)

4. BUSINESS APPLICATION SOFTWARE PACKAGES (continued. . .)

QTY	DESCRIPTION
7	WORDSTAR
7	ACC PAC A/R, A/P, G.L.
7	GEM DRAW
7	XTALK

5. COURSE AUTHORING PROGRAM

QTY	DESCRIPTION
7	Advanced Tutorial Model

C. HARDWARE

1. FILE SERVER

QTY	DESCRIPTION
8	3 COM 3SERVER3 with 70 MByte Hard Disk 70 MegaByte Expansion Unit, 960 KB RAM with 2 MegaByte RAM Expansion Card, 128 KB ROM, Serial Port, Parallel Port, 60 MegaByte Streaming Tape Back-up Unit, Data Shield Battery Back-up Unit, Real-Time Clock, 80 column N.L.Q. printer, Network Interface, Cables.

2. SINGLE DISK DRIVE WORKSTATION

QTY	DESCRIPTION
30	IBM PC Compatible, 640 KB RAM expandable, one 5 1/4" Flexible Disk Drive, detachable Keyboard, Network Interface Card, Hercules Compatible Graphics Card, 1 Serial Port, 1 Parallel Port, 5 Available Expansion Slots, Cables, MS-DOS

BILL OF MATERIALS

C. HARDWARE (continued. . .)

3. DUAL DISK DRIVE WORKSTATION

QTY	DESCRIPTION
16	IBM PC Compatible, 640 KB RAM expandable, dual 5 1/4" Flexible Disk Drives, Detachable Keyboard, Network Interface Card, Hercules Compatible Graphics Card, 1 Serial Port, 1 Parallel Port, 5 Available Expansion Slots, Cables, MS-DOS

4. HIGH RESOLUTION MONITORS WITH TOUCH SCREEN

QTY	DESCRIPTION
46	512 X 512 Pixel, Monochrome Monitor with Touch Screen, 14" diagonal, non-glare, Cables

5. PRINTERS

QTY	DESCRIPTION
9	Near Letter Quality, 80 column, Dot-Matrix, Graphics, parallel interface, Draft Mode option, 160 cps, Epson Fx86 Series. One included with each File Server (ie. 8 with Fileservers), one extra ordered.

6. MODEMS

QTY	DESCRIPTION
9	Multi-Tech 212AH2 1200 bps Modem. Features Auto dial and Auto answer, pulse or touch-tone dialing support, full or half-duplex to signal transmission.

BILL OF MATERIALS

D. FURNITURE

1. STUDY CARRELS

QTY   DESCRIPTION

25   Unit of 2 Study Carrels. Sides and back of Carrel
extended 24" above table level for student privacy
(custom ordered). Oak Arborite Finish, Chrome-plated
Legs, Sturdy. Require Assembly (screws in pre-drilled
holes)
Total of 50 study carrels as opposed to 45 ordered.

2. PRINTER / FILESERVER STANDS

QTY   DESCRIPTION

7   36" X 20"D X 26 1/2" H. locking casters, English
oak arborite, requires assembly.

3.STENO CHAIRS

QTY   DESCRIPTION

45   Gas Lift Seat height adjustment, adjustable back-rest,
charcoal coloured woven cloth seat & back

4. DISKETTE STORAGE UNIT

QTY   DESCRIPTION

8   SOTAL Diskette Tray. Plastic, holds 100-5 1/4"
diskettes, Removable hinged lid with lock, 8 dividers
in base. No-mar rubber feet.

5. POWER BAR / SURGE PROTECTOR

QTY   DESCRIPTION

15   Noise Filter and Surge Protector each with 6 outlets, on-
off switch, 15 amp/125V circuit breaker with reset button.
Nine foot power cord, plastic case.

PLATO CLUSTER PRODUCT

FILE SERVER
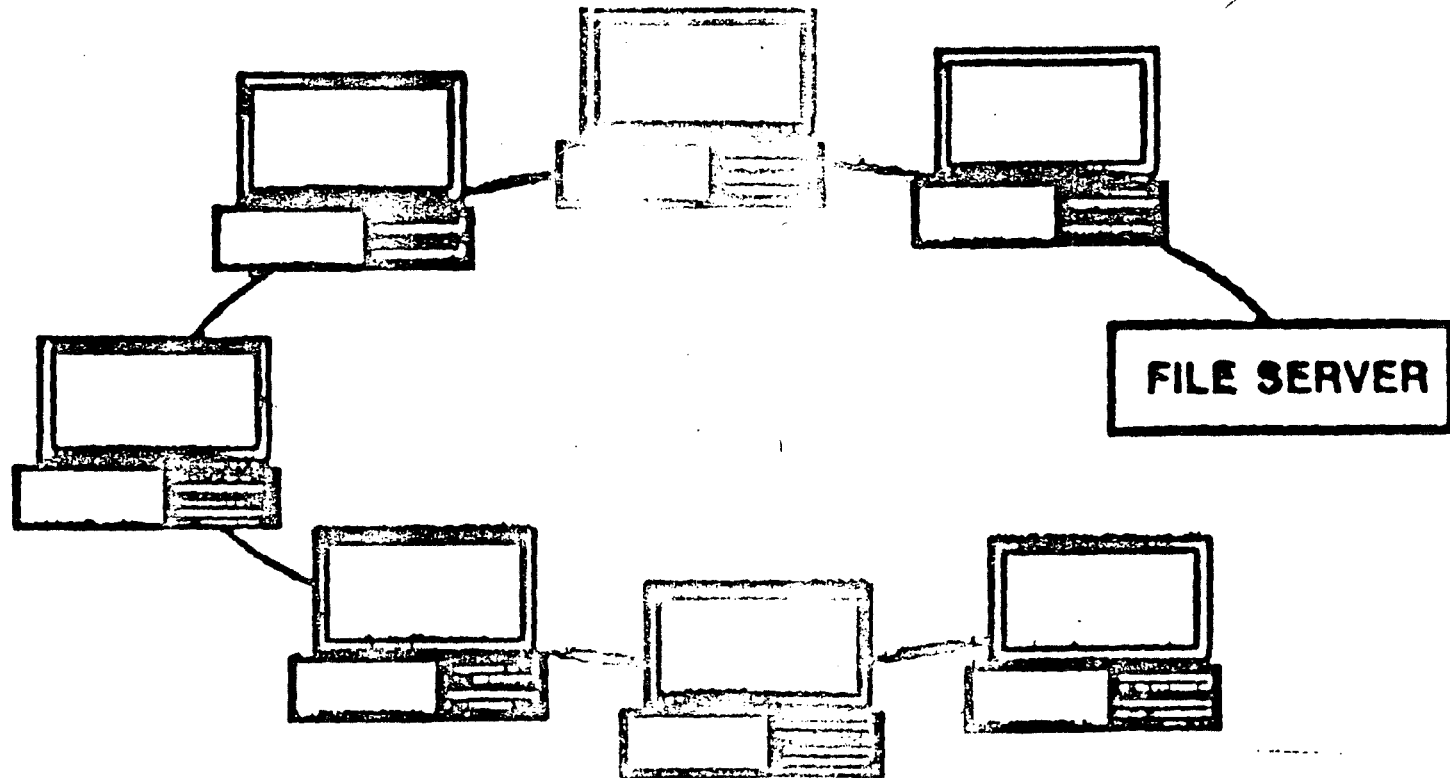
Authoring, Lesson Delivery, Instructional Management

Rostering and Record Keeping

Catalogs of Courseware

Download and Upload from/to Mainframe

Introduction to Local Area Networks

A Local Area Network (LAN) is a communications network.

Key characteristics of LANs are:

* High data transmission rates (100,000 to 100 million bits per second

* Short distances (100 feet to 30 miles)

* Low error rate (less than 1 error in 100 million bits).

The Local Plato Delivery System (LPDS) and Instructional Administration System (ADMIN) are proprietary systems which include the following features:

* Bus topology...A single cable is terminated on both endsinto which all nodes tap. Cable length between nodes can range from 3 to 1500 feet.

* Protocol...CSMA/CD (Carrier Sense Multiple Access/Collision Detection). A LAN Protocol is nothing more than the traffic controller on the equivalent to a telephone party line. A method of maintaining one-to-one conversations is necessary. Data is sent over the network broken into small 'packets'of 64 to 1500 bytes. At the head of each packet is the address of the intended recipient and the address of the sender. The tail of the packet contains an error correction code to verify that the data received was the same as that sent. *Carrier sense* means that each transmission is listened to by its sender to hear if it was understandable. If the message was garbled, the intended receiver is told to forget what they heard and another attempt is made. *Multiple Access* means that each node has access to the network at any time. Like an unruly conversation, anyone can talk at any time. This creates the potential for collisions on the network and must be dealt with in some manner. *Collision Detection* is the method by which each sender listens to its transmission to see if it has been clearly received. If a collision is detected, the sender 'backs off' for a random amount of time and transmits again. It is easy to see that collisions will slow the network down and that the network performance depends on network traffic and the number of nodes installed.

Another cause of collisions is the travel time required by the data packets. On network runs of about 1000 feet or more, the data packets sent by one node may not reach the receiving node before that node assumes a quiet cable and sends a packet of its own, causing a collision. Therefore, the longer network runs will have more collisions.

* Bandwidth...The base frequency used to transmit the information along the network determines the speed of transmission. The LPDS and ADMIN networks are called baseband which means that the signal is not modulated to a radio frequency carrier like those of television stations. This type of transmission limits the network to one channel of information but greatly reduces the hardware cost of the network cards. The bandwidth of the network is 10 MBPS.

DESCRIPTION OF A COMPUTER-MANAGED
INSTRUCTIONAL SYSTEM

PLATO LEARNING MANAGEMENT SYSTEM

The PLATO Learning Management (PLM) system is a computer-based system that helps instructors and authors organize instructional materials for individualized delivery and manages the delivery process for students. Instructors and authors need not acquire programming skills in order to use the full power of this system to administer tests, prescribe individualized study assignments, and keep important records.

PLM is designed to support a well-defined model of instruction characterized by modular organization of content and materials, defined mastery criteria, and self-pacing. Usually, instructors and authors can do much to adapt the base model of instruction to their particular needs simply by using the many options available.

CHARACTERISTICS OF THE PLM INSTRUCTIONAL MODEL

Courseware Modularity

All activity is organized around learning objectives that can be tested by the PLATO system or evaluated by the instructor. Learning activities are defined by the objective or set of objectives they cover. Modules are groups of objectives, courses are groups of modules, and curricula are groups of courses.

Mastery Learning

Each PLM student works at his or her own pace and proceeds to subsequent topics only when able to demonstrate the necessary proficiency in prerequisite areas.

In the PLM system, the term "failure" is not used; rather, the terms mastery and non-mastery are used to indicate the level of student performance.

Individualized Instruction

Only those learning materials appropriate to measured student needs are prescribed.
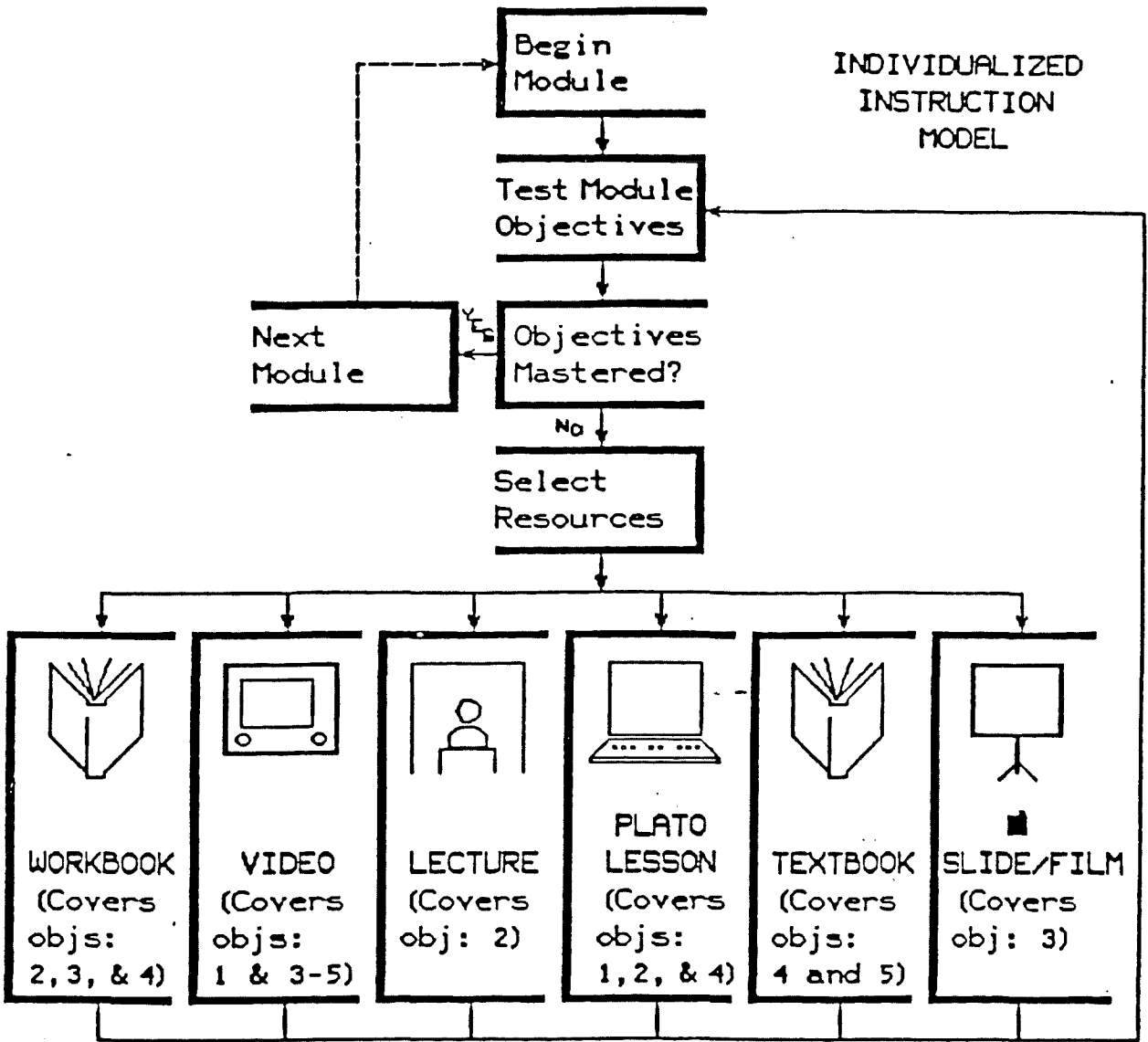model.

1214a

Figure 1-1. Individualized Instruction Model

PRIMARY PLM COMPONENTS

There are four primary PLM components:

    Curriculum

    Course

    Module

    Instructional Unit (IU)

The largest component is the curriculum, and each curriculum can include a maximum of 15 courses. A course can consist of up to 28 modules, each containing a maximum of 30 IUs. An IU can contain 60 questions that test a single educational objective.

Each PLM component has various options. Among the most important options are those in the curriculum and course Variable Management Strategies (VMS). The instructor with curriculum access can tailor PLM structures to different student groups by controlling such VMS options as course presentation and student directions.

From the curriculum, to the course, module, and finally IU, controls become more specific to allow tailoring instruction to the individual student.

PLM OPERATION

Many options exist for presenting courses and modules to PLM students.

If the placement testing option is used at either the curriculum or course level, the system can check for both readiness and prior mastery of subject areas. The curriculum test results are automatically used to select appropriate courses for each student. Similarly, the course level pretest results select modules.

A student usually works in a module first by taking a diagnostic test covering the objectives defined in the IUs of the module. At the end of the test, the system directs the student to the optimal set of learning resources covering the unmastered objective(s).

The student may retake a test after studying the selected learning resources. Should the student again not master the objectives, he or she is directed to additional learning resources. This process of studying learning resources and taking a test continues until the student shows satisfactory performance on a sufficient number of module objectives.

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PLM USER MODES

Author Mode

A user does not have to be a programmer to develop a PLM curriculum or module. Instead of programming, the author may use a wide set of authoring tools which comprise "author mode." The PLM author designs, constructs, and revises curricula, courses, modules, IUs, and test questions and performs many other tasks using these tools.

Instructor Mode

Instructor mode provides administrators and evaluators non-programming tools for using PLM.

The instructor registers students in the appropriate group and inspects and changes individual student records in the PLM gradebook as necessary. Instructors and evaluators can review group summary data in the form of tables and graphs.

An instructor with curriculum access can perform the functions of an author.

Student Mode

Student mode is the appearance of PLM to users with student "sign-ons" (registration). This mode presents courses and modules to students. The author determines which of several other options (such as gradebook access, display of objectives, and student notes) will be presented to students.

STUDENT MODE OVERVIEW

In order to better understand the PLM system, the student mode must be discussed. This section outlines what displays and options the student encounters when working in the PLM system. Refer to flowcharts 1-3.

Curriculum

When first entering a curriculum, the student receives some important and carefully organized introductory material. A welcome message and curriculum introduction, written by the author, are presented first. Further customized introductory material may follow if the author provides a PLATO lesson for this purpose. A placement test will come next, if one has been specified within the curriculum design.

After completing this introductory material, the student is routed directly to the Course Selection Display (or directly to the Course Modules List if the curriculum only has one course). The student then selects a course and is taken to it.

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Course

Like the curriculum level, the couse level also has a series of
introductory displays and activities. There is a Course Welcome Display
which will show the author's message. If the author specifies, each
course can present an introductory PLATO lesson and a course placement
test.

Module

The student enters a module by selecting it on the Module Selection
Display.

The objective is a statement of what is to be learned and how mastery
will be measured. Because of its importance, the objective statement is
always available to the student before beginning a test or reviewing
study assignments. The Objective Status Display shows which of the
objectives in the module have been mastered or attempted. From this
display, the student can also access a statement for each objective.

A student can begin a new session by reviewing a current study
assignment by selecting an option on the Module Introduction Display.
If the appropriate rule is set by the instructor, a student can view the
study assignment list prior to any testing in the module. After an
unsuccessful attempt to master the module test, the PLM system generates
a study assignment for the student.

If a module has unmastered prerequisites, no testing in the module is
allowed. From the Module Introduction Display, though, the student can
choose an option to see a list of the prerequisite modules.

When ready, the student may select the option to take the module test
which consists of a sequence of either true-false, multiple choice,
matching, touch, numerical, or short answer questions. The test is
terminated according to student performacnce, and the results are
displayed. If the test is mastered, the student is returned to the
Module Selection Display. If masatery has not been achieved, the
student selects either to review the objective status or to see a new
study assignment. From either of these displays, the student returns to
the Module Introduction Display.

Depending on the rules set by the instructor, testing for the module may
be locked as a consequence of one or more unsuccessful attempts at
module mastery.

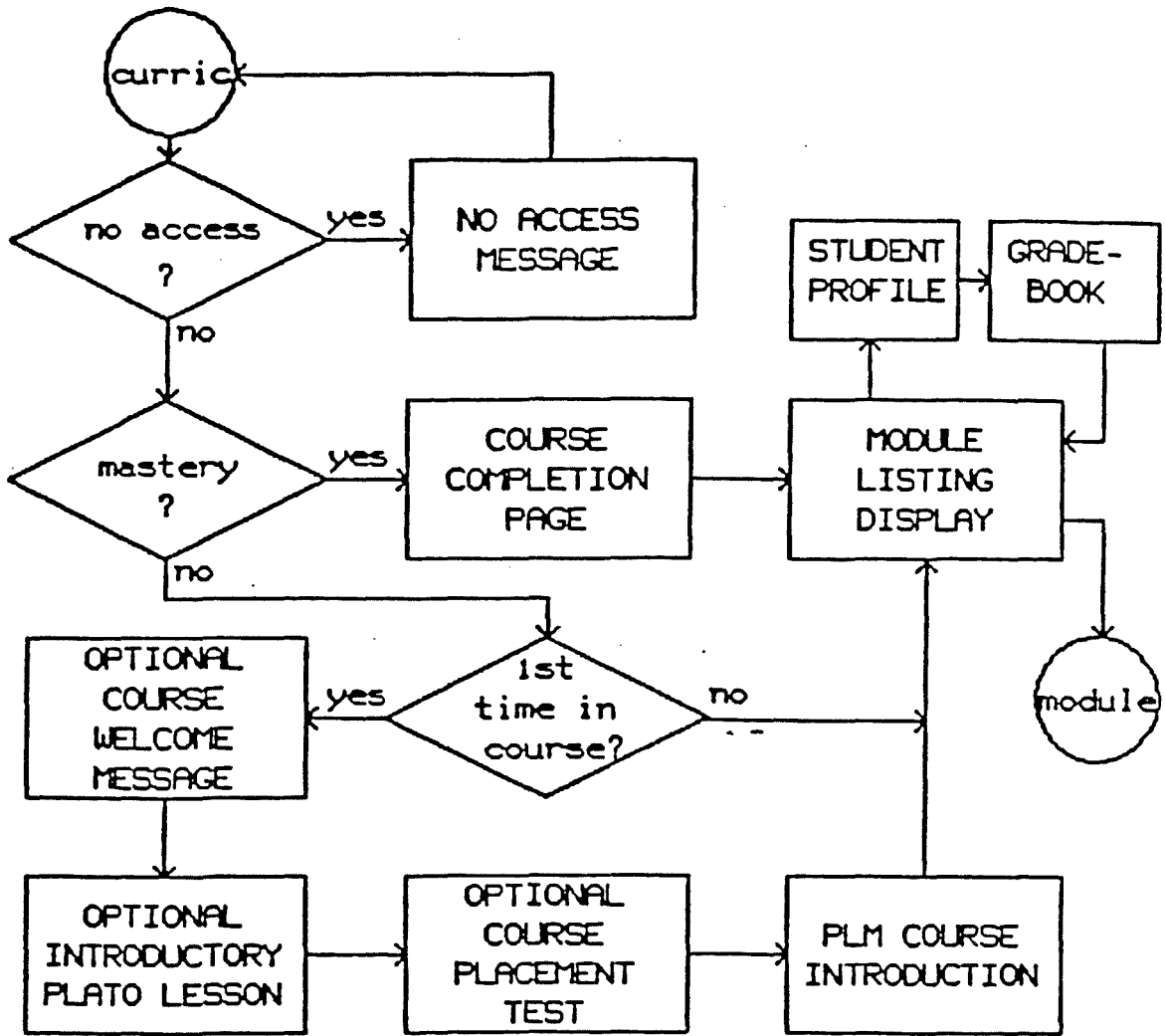# PLM STUDENT MODE FLOWCHARTS

The following are the PLM student flowcharts for the curriculum, course, and module.
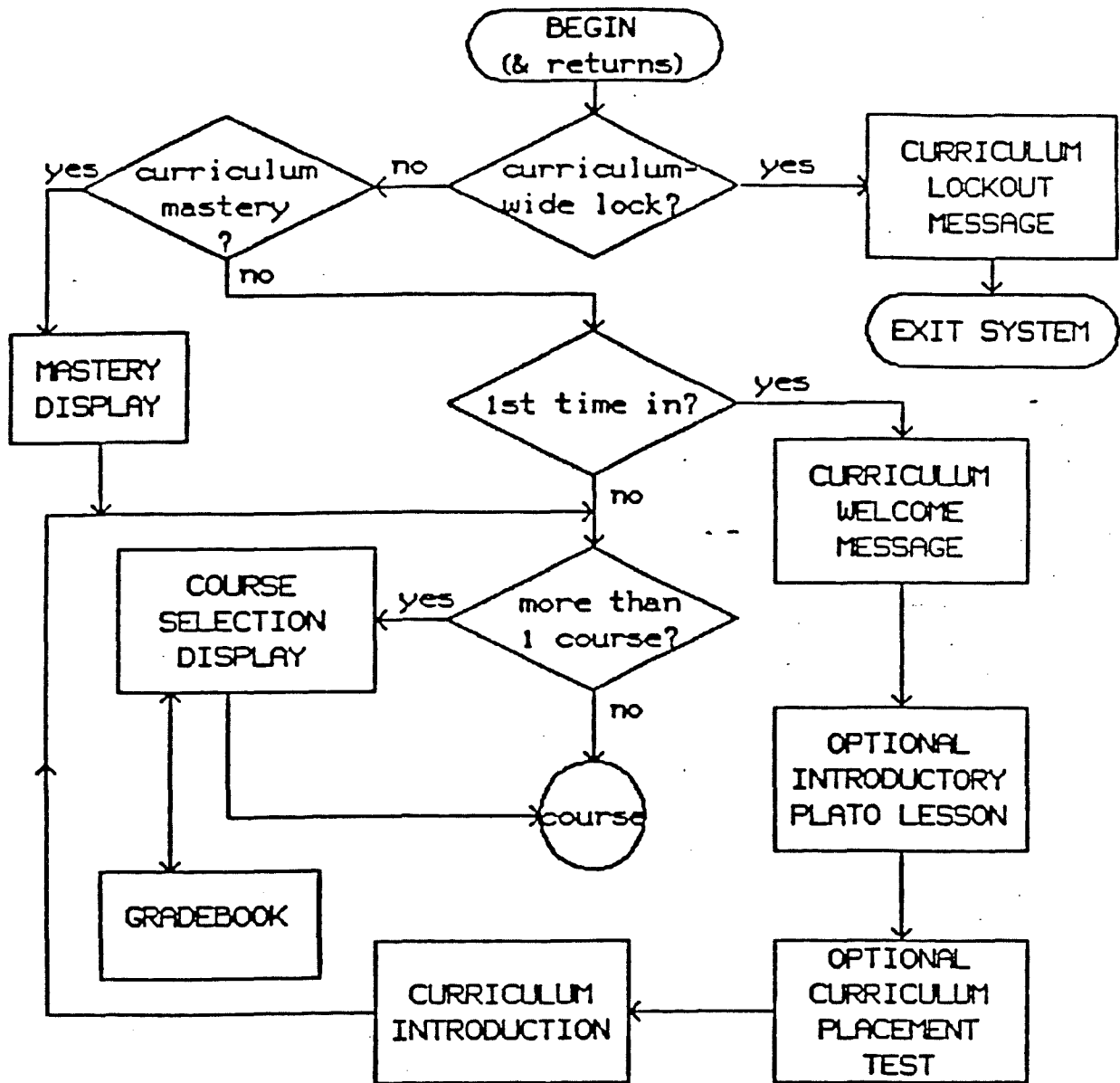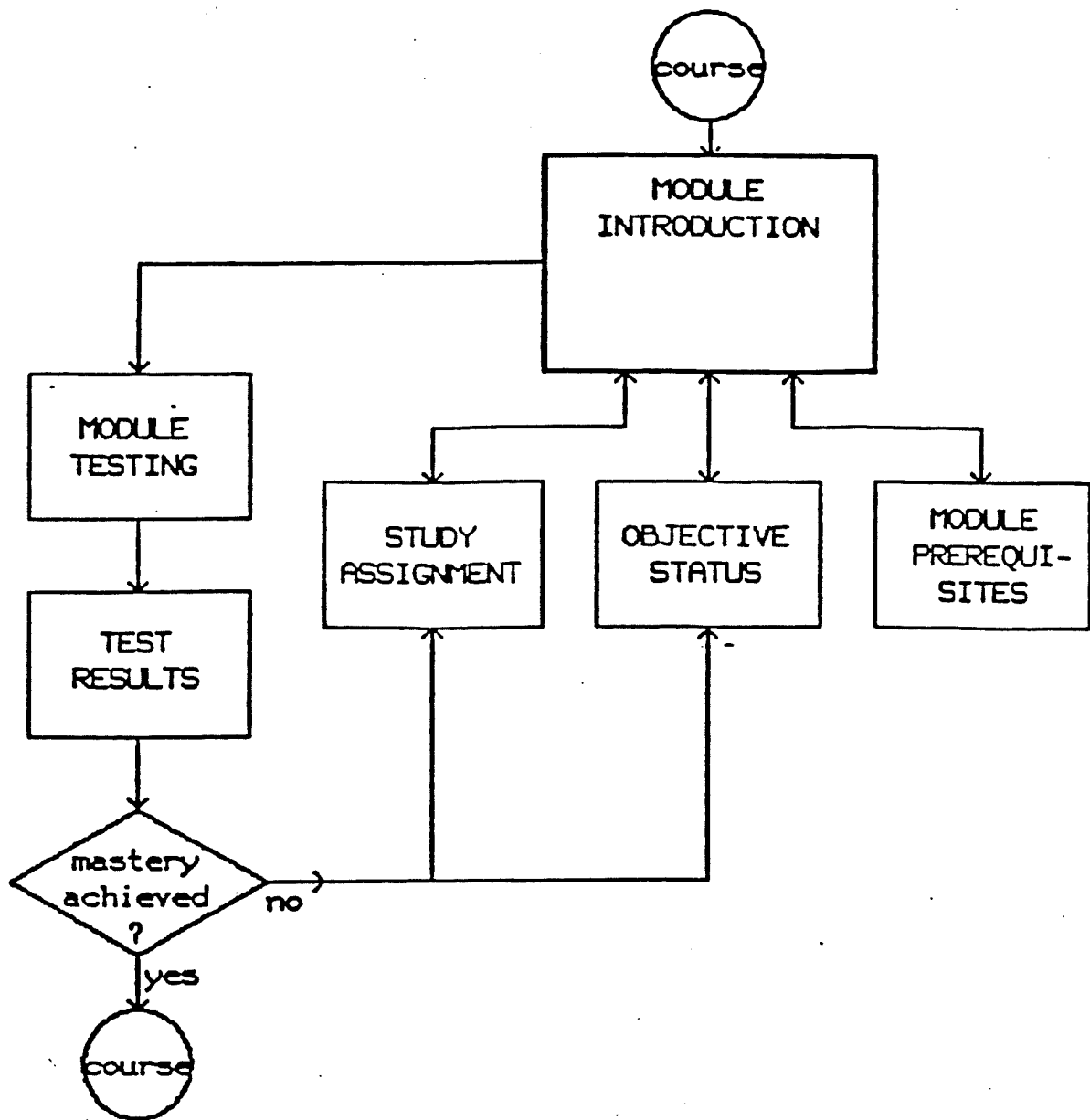

Student Mode: Curriculum Level Flowchart (1 of 3)
Figure 1-3

Student Mode: Course Level Flowchart (2 of 3)

Figure 1-3

Student Mode: Module Level Flowchart (3 of 3)

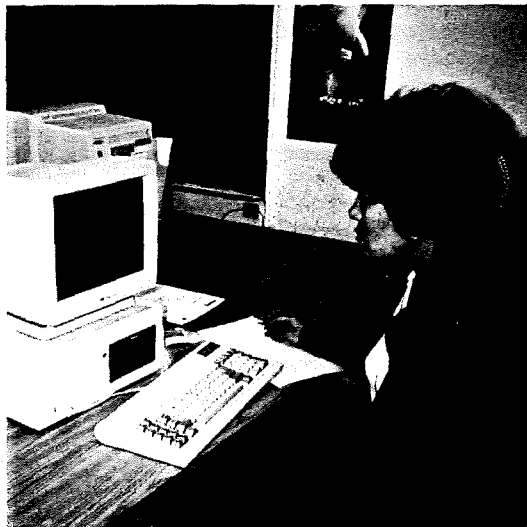Figure 1 - 3

PLATO system offers Inuit job training

Application Report #49

Many Inuit have trouble learning in a traditional environment.

Inuit suffer high ···nemployment rates and s of their native ..nguage.

.ATO offered the most integrated package of upgrading available."

Computer-based education boosts enrollments in Arctic College's adult education programs

The Northwest Territories government has supported computer-based education as part of its adult basic education program for Inuit, many of whom have had trouble learning in the traditional classroom environment.

Arctic College is using Control Data's PLATO Learning System to help overcome the education and employment barriers that most Inuit in the Keewatin Region of the Northwest Territories face. The adult education project is sponsored by the Keewatin Region Education Authority (KREA), an advisory body working under the province's Department of Education.

Second Year of Operation

The project, which began in May 1987, is now in its second year of operation. Start-up funding was provided under the federal government's Innovations program, with ongoing funding coming from the federal and Northwest Territories governments.

It is being conducted at adult aducation centres in seven communities, located along the remote northwest shore of Hudson Bay. The communities include: Rankin Inlet, Eskimo Point, Whale Cove, Baker Lake, Repulse Bay, Coral Harbour and Chesterfield Inlet. The largest community, Rankin Inlet, has a population of about 1400.

Total Enrollment is 300

There are between 20 and 40 adults enrolled in full-time programs at each centre and many more studying on a part-time basis. Total enrollment for programs stands at 300.

The programs are designed for adults who either didn't attend high school or left before graduating. They were put into place to help meet the strong need for adult education amongst Inuit. A study on the Arctic population, commissioned by Canada Health and Welfare, shows that Inuit are suffering high unemployment rates and loss of their native language. The traditional education system has failed to deal with these problems.

Rod Taylor, KREA project manager and Regional Superintendent of Advanced Education for the Keewatin Region, saw computer-based instruction as an innovative solution. The choice of Control Data's PLATO Learning System came after an extensive search across Canada by KREA.

"We didn't come across anything as comprehensive or complete. PLATO offered the most integrated package of upgrading material available," Taylor said.

The adult education centres offer academic upgrading in the areas of English and Math, as well as job readiness and computer literacy training.

PLAT○®

Computer-Based Trai

Demand Was High

A report on the project's first year of operation showed that the use of computer-based instruction increased the numbers of students enrolled in programs in all seven communities. Enrollments by employed persons and others who would not normally have been accommodated in regular full-time programming also increased.

Traditional classroom instruction programs were offered before computer-based education became available, but these were less successful with Inuit students. One community, Chesterfield Inlet, (which had not been able to sustain interest in traditional programs in recent years), was successful in the first year of the project because of the use of computers. All communities netted a combined total of 120 graduates from education programs.

PLATO Increased Academic Achievement

Adult educators teaching at the centres reported that computer-based instruction allowed for greater confidentiality and privacy in learning, benefitting those with learning problems and concerns. They also found that student motivation was increased and students were showing a higher level of academic achievement.

Taylor said that these successes meant that the project had to be expanded.

"We found that with two full-time programs in operation at most centres, we were restricted by the number of workstations we had. By increasing the number of workstations at each location, we could serve more people without hiring more instructors and adding those costs," Taylor explained.

Extra Staff Were Not Needed

For the project's second year, 32 computer workstations were added — bringing the total to 76. Extra staff were not needed, because computer-based education allows students to work at their own pace. Each student has an individualized educational program, which is tailored to meet his specific learning needs. The instructor is given the freedom to tutor each student on a one-to-one basis.

Heidi Wolter, Arctic College's Director of Community Programs for the Keewatin Region, said that computer-based instruction has also improved the reputation of adult education centres in the business community.

"Businesses take a more serious look at students due to academic upgrading and the job search and computer literacy skills we teach," Wolter said. She added that employers who knew of the computer element in the adult education program contacted the centre seeking computer-literate, trainable employees.

Job-entry Programs

Inuit youth are prepared for the world of work through Job-entry programs offered in five communities. These programs, which are funded by the Social Services branch of the Northwest Territories government and the Canadian Jobs Strategy program, include on the job training.

A work release program is offered to employed people who are able to spend part of their work week studying at a centre. Academic upgrading and other training related to their jobs can raise their level of employment and increase their chances of receiving promotions.

Canada Employment and Immigration Commission sponsored employment-directed training programs are in operation at each centre. These programs prepare students for a community college education or apprenticeship training.

New PLATO Grammar Course

Future plans for adult education in the Keewatin Region include the development of a new PLATO computer-based education course designed to teach the Inuit grammar in their native language, Inuktitut. The course is expected to be completed in the spring of 1989 and will be used to assist in KREA's Inuktitut as a first language literacy program.

This step is being taken to work towards a more effective educational model for Inuit students in the Arctic.

Computer-based instruction increased the number of enrollments.

"Businesses are taking a more serious look at students."

Academic upgrading and other training increases the chance for promotion.

New PLATO Inuit grammar course to be used in literacy program.

Arctic College brings computer-based education to seven remote communities in the Northwest Territories

The Northwest Territories government has supported computer-based education as part of its adult basic education program for Inuit, many of whom have had trouble learning in the traditional classroom environment.

Arctic College is using Control Data's PLATO Learning System to help overcome the education and employment barriers that most Inuit in the Keewatin Region of the Northwest Territories face. The adult education project is sponsored by the Keewatin Region Education Authority (KREA), an advisory body working under the province's Department of Education.

Second Year of Operation

The project, which began in May 1987, is now in its second year of operation. Start-up funding was provided under the federal government's Innovations program, with ongoing funding coming from the federal and Northwest Territories governments.

It is being conducted at adult education centres in seven communities, located along the remote northwest shore of Hudson Bay. The communities include: Rankin Inlet, Eskimo Point, Whale Cove, Baker Lake, Repulse Bay, Coral Harbour and Chesterfield Inlet. The largest community, Rankin Inlet, has a population of about 1400.

Total Enrollment is 300

There are between 20 and 40 adults enrolled in full-time programs at each centre and many more studying on a part-time basis. Total enrollment for programs stands at 300.

The programs are designed for adults who either didn't attend high school or left before graduating. They were put into place to help meet the strong need for adult education amongst Inuit. A study on the Arctic population, commissioned by Canada Health and Welfare, shows that Inuit are suffering high unemployment rates and loss of their native language. The traditional education system has failed to deal with these problems.

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Workstations Added

For the project's second year, 32 computer workstations were added — bringing the total to 76.

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ABSTRACT
        A project was undertaken to provide computer-assisted
instruction (CAI) to 92 native adult students in the Keewatin region
of the Northwest Territories of Canada. The project's principal goals
were as follows: attract and maintain the interest of a greater
segment of the target population, produce faster progress in academic
training, help program participants develop job readiness skills,
increase participants' chances of getting employment or improving
their level of employment, and create a more effective educational
model for Inuit students that may be used throughout the Arctic. A
year after the project began, it was evaluated both quantitatively
and qualitatively through such data collection instruments as
attitude assessments, journals and logs kept by program participants,
and onsite interviews with the adult educators and students involved
in the project. The adult educators participating in the project
agreed that the CAI format increased (sometimes dramatically) the
numbers of students in programs. Comparisons of participants'
performance on pretests and posttests showed average grade
equivalency gains of 0.63 and 0.92 grade levels after 3 and 6 months,
respectively, for 26 students for whom complete test results were
available. Students and teachers alike felt that the CAI enhanced
students' general computer literacy and specific job skills. (MN)

Preliminary Final Report:

Keewatin Region Educational Authority

Pilot Education Project

Computer-Assisted Learning

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INTRODUCTION

This is a summary report of the first year of a two year Computer Assisted Learning (CAL) Project being carried out with Inuit adult students in the Keewatin Region of the Northwest Territories.

BACKGROUND

The Keewatin Region is located on the eastern edge of the Northwest Territories, and comprises seven hamlets, or communities. Four of these hamlets, Arviat (formerly Eskimo Point), Whale Cove, Rankin Inlet and Chesterfield Inlet are situated on the west coast of Hudson Bay, directly north of the province of Manitoba. Baker Lake is about 200 miles inland from Chesterfield Inlet; Coral Harbour is located on South Hampton Island, and Repulse Bay on the Melville Peninsular. These isolated Communities can be reached only by plane, except for a short period in the summer when they can also be reached by boat. These seven communities' populations range in size from 190 (Whale Cove) to nearly 1,500 (Rankin Inlet). The Inuit population of these communities ranges from 77% in Rankin Inlet to 99% in Chesterfield Inlet.

The first language in the region is Inuktitut, of which there are many dialects. The functional literacy level in the English language is reached by about 23% of the population. There has been some form of adult education in the Keewatin Region for more than fifty years, beginning at the Catholic Missions, where adults were taught to read the bible, and continuing with informal training by community organizations. The Northwest Territories Department of Education established adult education centres in three communities in the 1970s; by 1987, there was an adult education centre in each community in the region.

As the communities moved from a traditional land-based economy (hunting, fishing) to a more wage-based economy, a demand for different marketable skills emerged. Students who saw little value in education when they were in school as children and adolescents found that they needed to be at least functionally literate in English to be employable as adults in this economy. They needed specific training for some jobs, and the language of that training was usually English.

PROJECT OBJECTIVES

The objective of this project was to conduct a pilot project in Computer-Assisted Learning (CAL) that would allow:

a) adults who have not succeeded in traditional education programs to work independently at their own level and receive regular constructive feedback; and

b) adults requiring specialized training to get it in their community, improving their chances either of getting employment or of raising their level of employment.

PROJECT GOALS

1. To improve and expand, through the implementation of Computer-Assisted Learning (CAL), academic upgrading, job readiness and special skill training for adults in the Keewatin Region. To respond to the special needs of unemployed Inuit who were not reached in the past by traditional training programs and methods.

2. To provide specialized skills training not usually available in small communities to unemployed Inuit and other members of the community. (Special attention was to be paid to areas of training where local employment was available.)

FUNDING

The Canada Employment and Immigration Innovations Program provided funding in the amount of $1.285 million over two years (1987 to 1989) for computer hardware, educational software, development of Inuktitut courseware, contract instructors, furniture, administrative support and external evaluation. The Department of Advanced Education, Government of the Northwest Territories, provided the equivalent dollar amount in person years, facilities and program operation and maintenance costs.

EQUIPMENT

Computer systems supplied by Control Data Canada were installed in the 7 Keewatin communities in August, 1987. The systems consisted of a Local Area Network (LAN) of either 5 or 8 computer terminal workstations, a 140 megabyte file server, printer, and a communications modem.

At the beginning of the second year (September, 1988), the number of computers was increased to 10 to 12 in each community.

The PLATO package consisted of Basic Skills, and High School Skills (GED) curricula. PLATO was used up to three hours daily by students as part of the adult basic education (ABE) program; business applications (chiefly databases, word processing and spreadsheets) were also used extensively.

ANTICIPATED RESULTS

The "anticipated results" in the original proposal for the Innovations Project were as follows:

a) Attracting and maintaining interest of a greater segment of the target population in educational programs.
b) Producing faster progress in academic training.
c) Providing job readiness skills.
d) Increasing chances of getting employment or improving level of employment.
e) The creation of a new more effective educational model for Inuit students which might be used through the Arctic.

FINDINGS

In year 1 (1987-88) of the project, the following findings were recorded:

1. Attracting and maintaining the interest of a greater segment of the target population.

The presence of CAL increased, sometimes dramatically, the numbers of students in programs, especially in evening programs, and enrollments by employed persons and others who would not normally have been accommodated in regular full-time programming. Also, one community (Chesterfield Inlet), which had not been able to sustain interest in traditional programs in recent years, was successful in the first year of this project in attracting and maintaining students because, in the opinion of the adult educator, of the presence of CAL.

On a daily basis attendance <u>rates</u> were about the same as in previous years in the Keewatin; however, given the fact that, compared with Kitikmeot region students, the Keewatin programs were attracting more students and students with more varied backgrounds (as described below), the fact that there was no difference in attendance rates may be taken as an indication of the power of CAL to maintain students' interest. [The Kitikmeot is a region of the Arctic to the west and north of the Keewatin, comprising the communities of Cambridge Bay, Spence Bay, Coppermine, Gjoa Haven, Holman Island, and Pelly Bay. The Kitikmeot served as a control region in this study.]

Regarding client characteristics, the following differences were noted: Keewatin students were older, academically higher (as measured by the TABE and average levels of previous education), had more recent work history, and were more often parents and spouses compared with Kitikmeot students.

Overall, the adult educators reported increased interest in the Adult Education Centres in the communities in the Keewatin region, better student retention rates, and more registrations by employed persons in special work-related CAL courses, as evidence that CAL had helped achieve this objective.

2. Producing faster progress in academic training.

Because of its familiarity to students and staff, and its historically wide-spread use in the Northwest Territories, the Tests of Adult Basic Education (TABE) (1976 version) were used to assess the speed and magnitude of academic progress. The TABE tests skills in reading, math and language; with scores in Vocabulary and Comprehension, Computation Concepts and Problem Solving, and Spelling and Mechanics. There is no written composition component.

TABE results showed average grade equivalency gains of 0.63 and 0.92 grade levels after 3 and 6 months, respectively, for 26 Keewatin students for whom 3 sets of tests (pretest, posttest 1 and posttest 2) were available. A comparison of the pretest grade equivalency average (6.5) with the April, 1988, posttest grade equivalency average (7.9) showed an increase of 1.4 grade levels. Data from the previous year in the Keewatin region showed an average increase of 0.8 grade levels, and results from the Kitikmeot region for the 1987/88 year indicated an average gain of 1.2 grade levels. No correlation was found between time spent in the program and gains in grade equivalency level for either the Keewatin CAL group or the Kitikmeot controls.

A large majority of both the adult educators and students in the Keewatin region attested to the efficacy of CAL as a learning enhancer. Specifically, self-pacing, privacy of results, freedom

of choice, and the availability of various specialized subjects (word processing, database, and spreadsheets, as well as advanced academic subjects such as math and science, and job search skills) were cited. Motivation was also increased by CAL, as was self-confidence in learning ability. Learning by CAL was perceived as prestigious and more effective by participants and the community at large.

Overall, the conclusion was reached that while CAL did not result in a major difference in rate or magnitude of learning gains as measured by TABE, it did contribute to significant increases in enrollment, enrollment of a wider variety of students, notably better success in communities where previous adult education programs had failed or had done poorly, improved retention of students, and a greatly improved self-image for participants, and a better image for adult education in the participating communities.

3. Providing job readiness skills

Students gained computer-literacy skills as a by-product of their use of CAL, and some students who pursued specialized training (word processing, database, spreadsheets and advanced topics such as higher math, physics and chemistry) also gained specific technical skills. Most users appeared to develop enhanced self-confidence and reduced reservations about computers as tools in daily life and employment. Many students reported their intention to pursue further technical training in the computer field.

Student attitudes were affected by the total adult learning experience, including but not limited to CAL: relations with supervisors, awareness of the job market, ability and willingness to seek employment, economic responsibility, family support, and cooperativeness were all rated higher on a pre/post measurement scale after completion of the program. Students and adult educators attributed some of these changes to experiences made possible by the presence of CAL.

4. Increasing chances of getting employment or improving level of employment

Acquisition of greater academic skills and credentials was regarded as prima facie evidence of greater employability. In addition, students' attitudes and plans were surveyed with a variety of instruments to show their specific intentions regarding employment: these proved to be very firmly oriented towards full-time jobs in the students' present communities, chiefly in trade and clerical positions. Expected starting salaries seemed

to be within reasonable limits. As well, some adult educators recounted cases where employers who knew of the computer element in the adult education program contacted the Centre seeking computer-literate, trainable employees. There were numerous cases of employed persons who formerly would not have accessed the Centre enrolling in computer-based academic upgrading and other training related to their jobs, thus increasing their promotability and potential level of employment. [Long-term follow-up of students will indicate whether these initial trends persisted after the project.]

5. Creation of a new, more effective educational model for Inuit students which might be used throughout the Arctic

Interviews and questionnaires administered to students and staff indicated strong support for CAL both as a component of upgrading, and as a tool for enhancing computer-literacy, and for specialized applications (word processing, data base and spread-sheets). Both adult educators and students appeared to adapt successfully to this innovation, though technical problems in some communities impeded early adoption to some extent. The adult educators reported adjustments in their role as instructors, chiefly due to a reduction in routine clerical, recordkeeping and instructional demands, and increased time and opportunities for individual and small group student interaction. In general, the difference was regarded by the educators more as a change in tasks and operations rather than as a true change in role.

As they became familiar with CAL's potential, both the adult educators and the students identified needs for courseware development. Topics for development included both supplements to existing materials, and new materials, especially in the areas of native language and culture. The adult educators requested that they be permitted to participate closely in the design and development of these materials. In the second year of the project, development and pilot testing of these types of materials was planned.

In sum, this project showed some of both the problems and exciting potentials of CAL in the North. Where it was most successful, CAL and the availability of the related sophisticated hardware and telecommunications equipment produced notable attitudinal and behavioral results and effects. Where it was less successful causes were most often related to technical failure or unrealistic expectations. Throughout the project, the incidence of these latter declined. Overall, the project has come to be seen as a successful example of the use of technology to overcome barriers to access for adults learning in Canada's remote areas.

(Valedictorian Address)

On behalf of the Adult Education upgrading students we
welcome our distinguished guests. From the day we started the
program to this day, we have worked hard to accomplish our
individual goals. We are pleased and grateful to the persons
who are responsible. They are Karen Blair and Lucy Evo.

During this year's upgrading, there has been days when
a student did not feel worthy of anything. Each student
thought they were not going to accomplish the grade ten
level. But when a life skills instructor came in to teach us,
most of us surprised ourselves what she had taught the entire
class.

At the beginning of the session, each student did not
pay much attention to what Mary Beth was teaching. As each
day progressed, the life skills session was getting more
interesting. She started the session with what each student
would wish to become after the upgrading program. Then she
moved on to a game which was charades. This game taught us to
act and communicate effectively in front of the people. It
has also taught us students to be more positive towards the
goals we set for.

There is one more thing that has immensely improved our
learning in education. It is the Plato Computers. It has
upgraded an individuals grades, taught them how to use
computers and above all, it was fun.

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Well, it has come to our end of this year's school

season. We hope there will be more school days in the future.

We did not seem to get enough of it. We also hope there will

be more courses and more people who will attend these

classes. Thank you very much for accepting our invitation.

Billy Suwarak

The Class of '88