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ABSTRACT

Designed to be used as a model for workshop planning, this report describes the development and implementation of a series of four summer workshops, entitled "Computers Plus," which were designed to increase the computer literacy of teachers and administrators. Intended to provide introductory students with basic concepts, hands-on computer experience, practice in software evaluation, and assistance in planning for microcomputer use, the workshops were offered jointly in June and July 1983 by the Northwest Regional Education Laboratory (NWREL) and the University of Portland in Portland, Oregon. Specific chapters suggest ways to design, organize, and operate workshops in order to meet the needs of diverse students. Evaluation results of the Computers Plus program that are reported are based on responses gathered from the NWREL Technology Center Workshop Evaluation Form and a participant questionnaire, and an assessment of the participants' technology background. Five recommendations and six references are listed. Appendices include the workshop registration form and materials and outlines for the four courses. (LMM)

No: 94 COMPUTERS PLUS: A PROGRAM TO DEVELOP COMPUTER LITERACY AMONG EDUCATORS

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PREFACE

The Research on Evaluation Program is a Northwest Regional Educational Laboratory project of research, development, testing, and training designed to create new evaluation methodologies for use in education. This document is one of a series of papers and reports produced by program staff, visiting scholars, adjunct scholars, and project collaborators--all members of a cooperative network of colleagues working on the development of new methodologies.

How should workshops to increase the computer literacy of teachers and administrators be designed, organized, and operated to meet the increasing needs of diverse students? This report describes one series of four summer courses developed to provide introductory students with basic concepts, hands-on computer experience, practice in software evaluation, and assistance in planning for microcomputer use. The report has been produced to provide one model for meeting the current high demand for such workshops.

Nick L. Smith, Editor
Paper and Report Series

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CONTENTS

COMPUTERS PLUS: A PROGRAM TO DEVELOP COMPUTER LITERACY AMONG EDUCATORS

Education and educators have been caught up in the computer revolution. Studies like the National Survey of School Uses of Microcomputers (The Center for Social Organization of Schools, Johns Hopkins University) show that the presence of microcomputers in our nation's schools is now past the 50% mark and rapidly growing. On the positive side, the Johns Hopkins study shows that in over 95% of those secondary schools with microcomputers, and over 80% of those elementary schools with microcomputers, there are at least one or two teachers who can be considered "regular users," and approximately 50% of the schools with microcomputers have three or more teachers who can be considered "regular users." (Center for Social Organization of Schools, June 1983)

These data may also be viewed in a negative way. From this perspective, it is clear that (1) about 50% of the schools have no computer, (2) in about 15% to 20% of the elementary schools with microcomputers there is no one who is a regular user, and (3) in over 30% of those schools with microcomputers, only one or two people are regular users. (Center for Social Organization of Schools, June 1983)

The study also shows that, on the average, there is but one computer for each 183 students at the elementary level, one for every 181 students at the junior high/middle school level, and one for every 125 students in public high school. And these computers are on the average used by fewer than 20% of the students in a week. (Center for Social Organization of Schools, June 1983)

Such information as the Johns Hopkins study, formal and informal needs assessment surveys conducted by the Northwest Regional Educational Laboratory (NWREL), and requests received by the University of Portland (U of P,) suggested that an introduction to school uses of microcomputers would be welcomed by a large number of educators. The question was how to design and deliver such an introduction.

In the fall of 1982 a brief but intense conversation between the authors convinced them that, first, such an introduction was needed and, second, that it was worth trying to persuade their respective organizations to support the idea. Thus began the dialog that resulted in a summer program called Computers Plus. This program was offered jointly by the Northwest Regional Educational Laboratory and the University of Portland in Portland, Oregon. It consisted of four courses offered during June and July of 1983 that attracted over 160 educators from throughout the western part of the United States, as well as Alaska and the South Pacific. (See the Program brochure reproduced in Appendix A)

The purpose of this paper is to describe in detail the Computers Plus Summer Program design process, organization and operation, and evaluation in the hope that others may use it as a model.

Program Design

The Johns Hopkins study shows that among computer-owning schools, 50% of the elementary schools, and up to 70% of the secondary schools have at least one person who writes computer programs, is a computer "hobbyist" and/or spends 3 hours per week at the keyboard. On the other side of the coin, 50% of the elementary schools and 30% of the secondary schools have no one who falls into these categories. While many schools have someone who teaches programming, the use of packaged programs is much more prevalent. For example, in 75% of the elementary schools

with computers, one or more people use packaged programs, and in 50% three or more use packaged programs. In comparison, in 60% of the elementary schools where people teach programming, only one or two people claimed this responsibility. (Center for Social Organization of Schools, June 1983). Of course, there is overlap between the people who teach programming and those who use packaged programs.

The belief that guided the design of the Computers Plus Summer Program was that educators need to be helped to become knowledgeable consumers of microcomputers and of the software that makes microcomputers such powerful educational tools. That is, we did not assume that the typical educator would do much programming, or teach programming to a great extent; rather we envisioned the most widespread use of the computer in educational settings to be as an aid to instruction, as opposed to an object of instruction, and as an aid to administration. We mean the computer as an aid to instruction and administration in the most extensive sense of that notion, including computer-managed instruction, computer-assisted instruction and the use of the computer as a tool for tasks performed by students, teachers, and administrators, such as calculating, word processing, data base management, and materials development.

Pedagogical Philosophy

The pedagogical philosophy which guided the design of the Computers Plus Program was based on two overriding concerns.

Computer literacy. The role of the educator as a computer user should be conceptualized as that of EVALUATOR OF COMPUTER APPLICATIONS for the purpose of facilitating and enhancing instructional and administrative activities. This conceptualization should be emphasized over the prevailing notion of user as programmer. That is, teachers should concentrate on planning for and using microcomputers in the classroom by developing skills in selecting and applying software appropriate for a particular setting, i.e., content area, grade level, and student

ability/interest. Administrators should also become able to evaluate and utilize software programs regarding their appropriate use for office and other related administrative tasks.

In summary, we believe that it is most advantageous for educators interested in incorporating microcomputers into their daily routines of instruction and/or administration to become competent evaluators of software, thus enabling them to knowledgeably select and utilize the most appropriate software from the ever-expanding market of available programs. In essence, that is our notion of computer literacy. (See the handouts in Appendix A for summaries of classroom and administrative uses of microcomputers.)

Experiential approach. The best way to become a competent computer user, or "computer literate," is through an experiential approach. In the case of an inservice program such as Computers Plus, class sessions should be dominated by demonstrations which help educators become aware of the basic concepts of microcomputer use. Then educators should have opportunities to apply the concepts learned during the demonstrations in order to facilitate the acquisition of skills. Concept and skill development should focus on three areas: (1) the operation of microcomputers, (2) the use and evaluation of specific programs, and (3) planning for the appropriate use of microcomputers. This curriculum model is depicted below.

Concept Development (Lecture/Demonstration)	Skill Development (Hands-on Laboratory)
Microcomputers and their operation	Learn General Operating Procedures (including simple programming concepts)
Use and evaluation of software	Review computer managed instruction, computer assisted instruction, materials development (e.g., PILOT), administrative application, and other software
Planning for microcomputer use	Develop a plan for specific uses

Research on Adult Learning

Several important concepts from recent studies of adult learning influenced the design of the Computers Plus Summer Program. One such concept was that "adults seek out learning experiences in order to cope with specific life-change events." (Zemke, R. & Zemke S., 1981, p. 45). Corollaries to this concept are that (1) if life-change events are work related, like the computer revolution in education is to educators, then adults will seek out work related learning experiences, and (2) adults are motivated to pursue learning experiences because they perceive a use for the knowledge or skill to be learned (p. 46). In addition, since the use of microcomputers was seen as threatening in many ways to educators, we felt that the program should be based on the idea that "increasing or maintaining one's sense of self-esteem . . . are strong secondary motivators to engaging in learning experiences" (p. 46).

In summary, the three major concepts about adult learning that guided the design of the Computers Plus Program were that:

- The computer revolution is perceived as having a great potential impact on educators' work environment and, therefore, they will be motivated to engage in learning experiences that will help them cope with this change.
- Educators will be most motivated to pursue learning experiences that they feel will give them useful skills and knowledge.
- A program will be most successful if it is designed to enhance educators' self-esteem in regard to the use of microcomputers.

The initial introduction to the Computers Plus Summer Program under THE CHANGING SCENE in the brochure reproduced in Appendix A was aimed at conveying our ideas along the above lines. After describing the rapid proliferation of microcomputers in schools, the introduction goes on to say:

> Teachers, school administrators, and support staff can feel bewildered and overwhelmed by this rapid advance of electronic technology.

The "Computers Plus" program will ease your anxiety about microcomputers by giving you the background and experience needed to successfully plan for and use microcomputers in school settings.

Program Organization

The Computers Plus Program was conceptualized as a general introduction to the educational uses of microcomputers. It was recognized that people would enroll with different degrees of familiarity with microcomputers, but it was assumed, and anyone who inquired was told, that the Program was for "beginners." However, the flexibility to meet the needs of people with different backgrounds and experiences was incorporated into both the general organization of the Program and the operation of the four courses.

The Program was designed to allow potential participants to choose among a variety of courses with different durations and focuses. We wanted to offer an intensive course right at the end of the school year that would allow people to gain three semester hours of credit without having to commit a large portion of their summer to school. We also wanted to offer a more traditional three-semester-hour course that would compete favorably with such offerings by other agencies, and would allow for a more indepth study of microcomputers.

There were two special topics that seemed necessary to consider. They were the special uses of microcomputers in instruction (e.g., music, special education) and the administrative uses of microcomputers for budgeting, scheduling, word processing, and so on. These we felt could be best offered as weekend workshops within the framework of the two three-semester-hour courses. This provided an opportunity for people with other commitments to take a course with a narrow focus and short duration.

We wanted the whole program to fall within a month's time right after the school year for three reasons. One had to do with the constraints imposed by leasing computer equipment.

Since we had to go outside of the University of Portland for microcomputer equipment, we needed to use the equipment as intensively and briefly as possible. Another reason for keeping the program to one month's time was the desire to convey the unique concentrated nature of the Program. And the third reason was to allow students and staff to have the remainder of the summer for other activities, such as a second set of summer school courses. Therefore, the following courses were delineated to implement the program design:

Course Title	Description
Microcomputers in Education	A one-week intensive introduction to the use of microcomputers
Microcomputers in Instruction	A weekend workshop showing the special use of microcomputers
Microcomputers for Classroom Use	A three-week introductory course in basic computer competencies and programs for classroom use
Administrative uses of the Microcomputer	A weekend workshop for administrative personnel

Program Organization

A series of activities took place between October 1982 and June 1983 which were critical for the actual organization of the Computers Plus Summer Program. These activities laid the foundation for the operation of the courses during June and July 1983. In addition, there were two sets of factors, financial and facilities, that were considered in the organization of the Program, and which influenced its operation.

Program Development Activities

The following list presents the major organizational activities that occurred in preparation for the operation of the Program.

Month		Activity
October	1.	Development of general program design Presentation of design to department heads and dean
November	2.	Permission by dean for feasibility study to determine potential cost of program, resources available on and off campus, etc. Presentation of design to the Director of the Computer Technology Program (NWREL)
December	3.	Report to dean and director on cost, resources, demand and target population
January	4.	Presentation of program design to faculty for information and input
February	5.	Dean submits program budget to central administration along with other summer courses as an information item
	6.	Contract negotiated with the Northwest Regional Educational Laboratory to provide technical assistance, materials, and other support
	7.	Delineation of responsibilities for Program within the School of Education
	8.	Meetings of planning committee regarding program organization every two weeks through May as needed
	9.	Contact with other units on campus for collaboration on program
	10.	General advertisement of Program in computer journals
	11.	Interaction with on-campus printing facilities regarding Program brochure: design, final mockup, and printing of 20,000 copies
March-May	12.	Advertising for the Program occurs in three tiers: national via computer journals; regional via brochures to each school; and local (within a 50-mile area) where individual educators were personnally contacted and/or received the brochure; Advertisements were placed in Electronic Learning and The Computing Teacher; 20,000 brochures were mailed, using metered mail, through the university facilities; Personal contacts are made with the administrators and teachers of the local schools for the purpose of recruitment

13. Identify qualified on- and off-campus personnel interested in being consultants (to give demonstrations), and assistants (to work in the computer lab)

March-June 14. School of Education office monitors enrollment; Enrollment is done through the School of Education and not directly through the Registrar's office; Discount of 5% is offered to early enrollees

June-July 15. On-site registration is organized and implemented by the School of Education's Administrative Assistant; First morning of each course the administrative assistant personally enrolls each participant and distributes course packets, including the course outline, University and NWREL brochures, and other relevant information.

Financial Considerations

The following list contains the financial considerations used in determining the fee structure for the Program, enrollment projections, and staffing.

1. [redacted] minimum number of participants needed (as a baseline) to insure breakeven point
2. Set a maximum number which the available facilities can handle (saturation point)
3. Determine the percentage of target population which are likely to attend
4. Detemine number of machines needed for an effective educational experience (machines/people)
5. Determine the number of microcomputers available on site; if not available in large enough quantity, contact regional suppliers for sufficient rentals
6. Based on amount of equipment needed, determine adequacy of existing facilities and the need for improvements
7. Acquire software (large variety of all subject areas); may be bought or borrowed
8. Determine journal subscriptions current or needed
9. Identify qualified personnel and their expense

10. Assess extent to which support services are to be utilized: duplication; typing; catering; security; media equipment; maintenance or repairs to equipment

The influence of these considerations will be discussed in the program operation section.

Facilities

In addition to the facilities needed to conduct the lecture/demonstration portion of the Program, there were some special facilities needed since a computer laboratory did not already exist on campus. The following factors guided the organization of facilities.

1. Ascertain available facilities: meeting rooms for small group instruction; large area (auditorium) for large group presentations and demonstrations; lab space to house hardware and software; housing accommodations for participants; dining facilities for participants

2. Furnishings for computer lab: adequate space for more than one person per machine; comfortable seating; cabinet for holding software; adequate lighting; air conditioning to maintain appropriate temperature for reliable operation of machines; blackboard for direction-giving

3. Adequate source of electricity for a large number of machines (most likely added power will need to be brought in); also needed are electrical outlets

4. The lab should be a secure room which is always locked when not in use. Added security measures are encouraged.

Program Operation

In order to conduct the Computers Plus Summer Program in a manner consistent with our pedagogical philosophy, we made certain choices regarding its operation. One set of choices had to do with the timing of the courses themselves. Another set concerned the resources, i.e., equipment, people, and materials considered necessary for the successful operation of the

program. A third set concerned the flow of activities within the courses, including the common aspects of all four courses and the unique aspects of each course.

Timing of the Courses

As noted above, the entire Computers Plus Summer Program took place during a four-week period, from June 20 to July 14, 1983. Four courses were offered for a total of 8 semester hours. The courses were offered in the following sequence:

Course Title	Hours	Times	Dates
Microcomputers in Education	3	8am - 4:30 pm	Mon. - Fri. June 20 - 24
Microcomputers in Instruction	1	1 pm - 7 pm 8 am - 5 pm	Fri. June 24 Sat. June 25
Microcomputer for Classroom Use	3	8 am - 11 am (except Jul.4)	Mon. - Thurs. June 27 - July 14
Administrative uses of the Microcomputer	1	8 am - 4:30 pm	Fri. & Sat. July 8 - 9

Resources

The Computers Plus Summer Program was intended to offer a unique experience to participants. Its concentrated nature and mix of course offerings were one aspect of this uniqueness. Another aspect was the set of resources that were pulled together to operate the Program. These resources were the microcomputer laboratory, the people to run the lab and provide the lectures and demonstrations, and the materials used in the Program, in particular the instructional materials and the software.

Microcomputer laboratory. From past experience, and from a report of research conducted at the University of Michigan, it was determined that up to three people could profitably share a microcomputer. However, our experience also showed that this was the case only for certain types of activities. For example, when evaluating a given piece of software, it was often worthwhile for

more than one person to be sitting at the computer. And during the initial introduction to the computer, it was advantageous to have a more experienced user sit with a novice so that help was immediately available with unfamiliar terminology and procedures. But even in this case, as was certainly the case when word processing, data base management, materials development, and simple programming were introduced, it was strongly desired by most participants to have just one person per machine. This avoided the necessity of one person sitting idly by while the other person sweated over typing errors and other mistakes.

In order to achieve this ratio of people to machines, a laboratory of microcomputers was established and a group of consultants was hired. In this way the courses could be organized so that participants were either in lecture/demonstrations or working on the computers.

A microcomputer laboratory was set up at the University of Portland. Since we anticipated a maximum enrollment of 50 people for any one course, the lab consisted of 25 Apple computers (primarily Apple IIe) with two disk drives and monitors. There were five color monitors and three printers. The total cost of the renting this equipment for a month was approximately $7000. The equipment was rented from a regional vendor who set up the lab, maintained the machines, and disassembled the lab at the end of the Program. The laboratory had to be specially wired to provide power for this many machines. Each row of five machines was run on a 220v line. Four new lines were brought into the lab. The fifth bank of machines was powered from an existing wall receptacle.

The lab was in a tiered lecture room so that each row of people could see over the top of the row in front. Although the chairs were fixed to the tables, they swiveled, which made seating very convenient. The room was, of course, lockable. Additional security was provided by the campus security force, which included the lab on its regular rounds of inspection both day and night and on the weekends.

Maintaining a smooth flow of activities in the laboratory was just as important as in the classroom aspect of the Program. In order to manage the laboratory the following measures were taken:

1. A secure area for cataloging and housing software within the lab was set up right inside the only entrance to the lab.

2. A software catalog was posted on the wall right inside the door, but somewhat away for the secure area. Here software was listed by ID number, title, subject matter, educational level, company which produced it, and who it belongs to if borrowed.

3. Clear procedures for checking out and returning software within the lab were communicated and enforced (e.g., each piece of software had a card, an assistant located the software requested, and the borrower initialed its card when checking out and returning it; no software left the lab).

The people and materials which made the laboratory a very successful part of the Program are discussed next.

People. There were three groups of people who contributed to the operation of the Program. The first group of people consisted of the authors, who acted as the Program Director (Peter Gray) and Program Coordinator (Jon Tafel). Together with the School of Education Administrative Assistant (Stephanie Walters), they formed the planning committee which managed the organization of the Program from October 1982 to June 1983.

The administrative assistant was primarily responsible for such activities as arranging advertising, and monitoring early registrations. During the operation of the Program, the administrative assistant supervised the day-to-day management concerns, such as the registration of participants at the start of each course, the monitoring of materials so that sufficient copies of handouts were available when needed, and the answering of questions about University procedures regarding grades.

The Program Coordinator was resposible for such University related matters as the physical setting up of the lab, as well as gaining approval of the Program. During the operation of the Program, he coordinated the laboratory activities, especially the circulation of software.

The Program Director was responsible for the development of the curriculum for the Program, the provision of written materials and software for the Program, and the selection and coordination of the other people who assisted in the operation of the program. He was also the primary instructor for the classroom portion of the program.

The second group of people who contributed to the operation of the program were the paid assistants and consultants. There was an assistant in the laboratory (an undergraduate university student) who helped with the circulation of software. There was also one other assistant in the lab who provided individual help to Program participants. The computer assistant was an educator who had considerable experience working with other educators in the area of microcomputers. The assistants were also chosen based on their knowledge of a computer language (e.g., BASIC, LOGO, PILOT). In this way, even though programming was not the primary emphasis of the Program, instruction was available to those participants who wished to learn how to program. During the one-week course there was also an instructional assistant who taught some of the lecture/demonstration sessions. The assistants were hired on an hourly basis.

The third group consisted of paid and unpaid consultants. Paid consultants were people at the University of Portland and people from the community who had special expertise, for example, in the use of microcomputers in music instruction, their use in fire safety instruction, or in the administrative uses of computers.

Unpaid consultants were employees of local computer stores or sales representatives of software or hardware companies. Their invovlement was predicated upon their emphasizing a particular software or hardware feature, issue or concept, and not just a particular product. People who became involved were, for example, the local and regional Scholastic Inc. representatives, the local Encyclopedia Britannica representative, the local Millikan Publishing Company representative, the training

coordinators from two local computer stores, the education representative from the local IBM office, and sales people from other companies around Portland. They came a number of times in half-day blocks to speak with participants during all four courses.

Securing assistants and consultants occurred in a four-step process. First, potential assistants and consultants were identified. This was one type of support that was provided by NWREL. The Computer Technology Program has a list of local computer firms and representatives. This list led to the initial contact with many of the consultants. The University of Portland has a list of people who teach off-campus microcomputer classes. This list provided initial contacts for assistants. The second step was to send letters or to call potential assistants and consultants. Form letters were developed to ease the task of contacting each kind of person. Third, people who expressed interest in being assistants were asked to send a vita detailing their microcomputer related experiences. Those who were interested in being consultants were requested to submit a proposal regarding a topic to be presented. These were screened by the planning committee. Fourth, follow-up phone calls were made to explore the availablility of people for a certain period, and for certain responsibilities or topics.

Materials. The third major resource of the Computers Plus Program was the printed and software materials available to participants. A major contribution to the success of the Program was made by the instructional materials used in the courses. These were provided as part of the contract with the NWREL Computer Technology Program. They are being field-tested in the form of handbooks for conducting workshops on microcomputer literacy for teachers and for administrators, and will be available in 1984.

The text used for the three-semester-hour courses was Computers in Curriculum and Instruction, edited by M. Tim Grady and Jean D. Gawronski (The Association for Supervision and Curriculum Development, 1983). The text provided a good overview

of the important issues and topics related to using microcomputers in the classroom. In particular, it provided a good discussion of computer literacy, that is, one very similar to our notion of a competent computer user. This is the idea of computer literacy that we suggested for students as well.

There were over 100 books and reprints of articles on reserve. They addressed specific issues and topics such as programming, computer literacy, the use of spreadsheets, adminstrative uses of microcomputers, and LOGO. (A copy of the list of reserve materials may be obtained by writing to Peter Gray.)

Many of the books and articles on reserve were obtained from the library at the University of Portland or from the Information Center at the Northwest Regional Edcuational Laboratory. Others were solicited from publishers in the form of review copies. In fact, some publishers were willing to send multiple copies of books with the understanding that they would be returned at the end of the Program. A collection of publishers' catalogs was also formed. Participants were free to take personal copies of these catalogs.

One general catalog was especially useful to participants. It is the Swift Educational Software Directory (Sterling/Swift, 1983), which lists Apple software. This was an invaluable resource for students in the description of software and for the Program Director in the development of the software library for the Program. There are other similar directories available for other software.

The Program's software library had over 250 items. They ranged from individual programs for preschoolers, e.g., Juggles Rainbow, to complete sets of courseware, e.g., the Millikan Math sequences. The software library was another area where support for the Northwest Regional Eductional Laboratory was critical. Since the Microcomputer Technology Program operates the national MicroSIFT evaluation program, software firms supply NWREL with produces for review. Those products that had come back from

reviewers at the end of the school year, or that had been received too late in the year to be sent out for review, were made available to the Computers Plus Program.

There are other agencies with extensive software libraries that may be willing to make them available. For example, many schools do not use their software for parts of the summer, in the evening, or on weekends. In addition, many software producers are quite willing to loan software on a review basis for a specified length of time. The Swift Directory is an excellent resource for identifying producers of software. A phone call directly to the producer is the best way to initiate contact, since one can immediately ascertain the willingness of the producter to loan software. This can be followed by a letter stating the specific software desired, and the conditions of the loan, such as when the software is needed and when the software will be returned.

The important thing to remember in putting together a software library is to have a variety of programs available for review. There should be a variety in terms of levels if, for example, elementary, secondary, and post-secondary educators are participants. Similarly, there should be a variety of subject areas to match the mix of participants. A variety of types of software should also be available. That is, there should also be drill and practice, tutorial, simulation, and application software appropriate for the kinds of participants expected.

It is not as important which specific programs are available, since there are many good programs in each area, at each level, and of each type. Even poor software can help sharpen one's understanding of what makes a good program. Instead, it is a variety of software and a systematic evaluation process that will enable educators to become competent users of microcomputers.

General Aspects of the Courses

The concentrated nature of the Program was achieved through the intensive utilization of the resources within the brief timing of the four courses. Both the three-semester hour and one-semester hour courses were operated around the concept-development/skill-development model described earlier. That is, each course, no matter how brief, had both lecture/demonstration, and hands-on laboratory instruction.

In addition, each course had three distinct areas of emphasis. The courses each began with a discussion of microcomputers and their operation, and an opportunity to learn some general operating procedures, including simple programming skills. Then a variety of software concepts was presented, along with an opportunity to evaluate programs firsthand. Finally, a structured planning opportunity was provided so that participants became aware of important planning concepts, and could practice developing plans for using microcomputers.

The materials used to implement the three parts of each course are part of the handbooks being developed by the Computer Technology Program. For information about the availability of those materials, contact Barbara Rozell, Technology Center, Northwest Regional Educational Laboratory. The three general aspects are described next. They are followed by descriptions of the unique aspects of the four courses.

Microcomputers and their operation. A transparency showing the major components of a microcomputer station was used to introduce participants to microcomputers in each of the four courses (see Appendix A). A vocabulary handout accompanied the transparency. Following this introduction, participants used the computers in the laboratory for a hands-on activity designed to introduce such system commands as LOAD, RUN, and SAVE. The conclusion of this activity was the initialization of a diskette, using a simple HELLO program written in BASIC.

These activities took place during the first half-day of each course, and proved to be an excellent introduction. They really did seem to help demystify the microcomputer.

Use and Evaluation of Software. Extensive hands-on experience is the key to competent and confident microcomputer use and, in fact, defines our idea of computer literacy for educators and students. In addition, systematic evaluation procedures help educators differentiate good from poor software in an objective manner. The major points of a well written program are that it should (1) facilitate the inputting of information, (2) provide necessary information to the user, and (3) make good use of the computer. As participants became more familiar with microcomputer software, they were able to identify specific program characteristics that were examples of either well written, or poorly written microcomputer software. These general points provided the basis for their subjective evaluation of software.

Participants in the three-semester hour courses also used systematic evaluation methods to objectively assess software. Two methods were used, namely, the MicroSIFT process, developed by the Computer Technology Program, and the Microcomputer Courseware Evaluation Open Checklist developed by the Research on Evaluation Program. The MicroSIFT checklist is especially useful for initial screening of software. The process recommended is for a content person (e.g., curriculum coordinator), at least one teacher, and a technical person to review software independently. They should then come together and form a consensus rating. This process has been carried out for over 300 programs which have been rated using the MicroSIFT process. Reviews of these programs are available from the Computer Technology Program and are on its RICE (Resources in Computer Education) data base.

The Open-Ended Checklist is designed to gather information for planning the use of microcomputer software. The process recommended is for a teacher to observe a student when the student is actually using a piece of software. Each step in the operation of a program is covered in the checklist, and a series of questions about the students' reaction close the checklist.

Participants in the three-semester hour courses were required to complete three MicroSIFT reviews with at least one other person, and preferably with two other people. Then each participant individually used the Open-Ended Checklist to observe someone using one of the pieces of software previously evaluated through the MicroSIFT process. The three MicroSIFT reviews and the one open-ended checklist review were a major requirement of the three-semester hour courses.

More information about, and copies of the MicroSIFT and Open-Ended Checklist can be obtained from the NWREL Computer Technology Program, and the NWREL Research on Evaluation Program, respectively.

Since time did not permit the use of the MicroSIFT and Open-Ended Checklist during the one-semester hour course titled Microcomputers in Instruction, participants in this course used a simple software evaluation form from the October 1983 issue of Electronic Learning, pages 47-48. Administrators were introduced to both the MicroSIFT and the Open-Ended Checklist evaluation procedures. However, they were provided with a separate checklist for administrative software. This checklist is included in the handbook on computer literacy for administrators, which is being produced by the Computer Technology Program.

Once participants had been introduced to the evaluation concepts and procedures, and had had an opportunity to review some of the software in the laboratory, consultants were brought in to describe other software and equipment. For example, educational uses of VisiCALC were presented by a local computer store training coordinator. Music applications were presented by a University of Portland professor who had a complete micro-computer laboratory of her own on campus. Scantron equipment was demonstrated by a local sales representative. The director of the instructional media center at the University of Portland demonstrated voice activated equipment which can be used by the physically handicapped. In addition, LOGO, BASIC, and PILOT were demonstrated by course assistants. This provided participants with an opportunity to learn these languages if they so chose.

Typically, each consultant presented a 30-minute to 50-minute lecture/demonstration, and repeated it three times in a half-day period. Sometimes the lecture/demonstration was much briefer, and participants were simply given an opportunity to try the software, or equipment brought by the consultant. For example, one consultant brought Franklin Computer equipment, and such software as Story Maker and Mastertype. These programs were of particular interest to many of the participants, who spent a considerable amount of time becoming familiar with them. Many consultants came back for all three teacher-oriented courses, and some even made presentations to the administrators as well.

Planning for microcomputer use. The other major requirement of each course was a plan which described how microcomputer concepts, issues, and/or technology would be used by participants in their particular setting. The following outline provided the structure for this plan: (1) a brief description of the educational setting (class, grade, special characteristics of students, location, i.e., central office, or school building); (2) the problem to be solved by microcomputer use; (3) the alternative solutions available; (4) the steps to be taken in solving the problem, including the timeline and resources needed; (5) the evaluation design to be used to determine the success of the plan.

The description of the setting was intended to cause participants to think about the use of microcomputers within a particular context. The identification of a problem focused attention on the use of the microcomputer as an aid to instruction, and/or administration and not as an end in itself.

The establishment of alternatives was intended to emphasize that there are many ways to solve problems. That is, different software may be used to solve the same problem. In addition, if a non-technological solution is possible, it should be given equal consideration with the technological solution, especially for administrative applications.

It was important for participants to realize that the integration of computers into an instructional or administrative setting would not be accomplished in one simple step. Therefore, in laying out the steps, and their timelines and resources, people began to sense the magnitude of the task involved in using microcomputers.

Finally, the development of an evaluation design pointed out the necessity to continually review the use of technology. It is anticipated that the development of a computer technology program, either in an instructional setting, or an administrative setting, will take from three to five years; during that time the use should be evaluated to determine first, whether it should be continued, and second, in what sense it should be changed, if it is continued.

The administrators received a copy of a paper presented by Peter Gray at the annual meeting of the Washington Educational Research Association titled Organizing for Microcomputer Use in a School District. This paper describes the important factors to consider in planning. A copy of this paper is available from the author.

Participants' planning projects varied from the development of a community college reading program, and a community college health/technology program module by instructors using the PILOT authoring language, to a kindergarten computer literacy program complete with flash cards.

In the three-semester hour courses, participants presented brief (ten-minute) descriptions of their projects the last day of class, in what were called poster sessions. That is, each person developed some sort of visual summary of his/her project (e.g., an outline, a collage, key words) to accompany the presentation. These provided the other participants with an understanding of the range of activities available with microcomputers. People were grouped by grade level and subject area, so that they heard other presentations which were most relevant to their educational uses of computers.

Another feature of all courses was the development of a data base of participants using a public domain data base called File Cabinet. Each person took home a diskette with the data base of the people in his or her course, so that afterward contact could be made to explore ideas as they developed over time.

The Unique Aspects of the Four Courses

In this section details of each of the courses are discussed. These include both the activities presented and the utilization of resources. The outlines for the courses, which are located in Appendix B, illustrate in a general way how the parts of each course were coordinated. The unique aspects of each course are briefly described below.

Microcomputers in education. The first course in the program was intended to be the biggest draw. In order to attract people to this course, a number of special features were offered including its one-week timeline, 3 semester hours of credit, and placement at the close of the public school year. These features served to attract people who had other commitments for the rest of the summer. Approximately 50 people attended this course.

Another special feature was a series of social activities. Social events were used to give participants an opportunity to meet each other informally, to talk informally with the instructors, and to begin to form the networks that would provide support once they got back to school in the fall. In addition, because the week was so intense with either lectures or hands-on computer use going on all day long, it was recognized that participants needed time to unwind and to talk about their experiences in a relaxed atmosphere. The wine and cheese party on the first day of the course, and the dinner with a keynote speaker which was also preceded by a wine and cheese hour on Thursday, the next to last day of the course, proved to be much needed social events.

Microcomputers in instruction. This brief, intense one-semester-hour course took place immediately after the one-week course. Aside from short presentations on demystifying the microcomputer, software evaluation, and planning, most of the time was spent at the computer reviewing software. The entire laboratory collection of 250 pieces of software was available for review, and consultants with special uses of microcomputers made presentations throughout the second day of the course. This course met the needs of the people who simply wanted to see a variety of software. Approximately 35 people attended this course.

Microcomputers for classroom use. The main attraction of this three-week, three-semester-hour course was its liesurely pace in comparison with the pace of the one-week course. This longer time period provided considerable opportunity for software review and project development. The lab was typically kept open until noon each day, that is, an extra hour during the morning, and also during some afternoons. The same mixture of presentations from instructors and consultants as in the one week course gave participants a chance to learn about many different types of software and languages, such as LOGO, BASIC, and PILOT. Approximately 30 people attended this course.

Administrative uses of the microcomputer. It was very difficult to borrow scheduling, attendance, and other complex programs. Therefore, we relied on vendors and local school district administrators who had experience with these programs to give participants firsthand information. We had the most difficulty arranging for consultants who could provide such experiences for the administrative workshop. Of course, we were able to demonstrate the use of word processing, spread sheet, and data base management software by using generic programs (e.g., Bank Street Writer, VisiCALC, DBMaster). The identification of district policies regarding microcomputers helped administrators think about the way microcomputers should be used. A series of handouts and transparencies that are part of the paper on organizing for microcomputer use in school districts was distributed to participants in the administrative workshop. Approximately 50 people attended this course.

Evaluation and Recommendations

The main evaluation of the Computers Plus Program courses was conducted using the NWREL Technology Center Workshop Evaluation Form. Table 1 contains the average ratings given to each course regarding the presenters, instructional materials, hands-on activities, the information presented, the structure, and the course in general. The ratings are based on a scale of 1-4, where 4 indicates strong agreement with the statements, and 1 indicates strong disagreement.

Clearly, the hands-on activities (item 3) provided by the computer laboratory were consistently among the highest aspects of each course. In fact, because of the high regard for this aspect, participants viewed other activities, such as formal software evaluation and planning, as distracting, and hence rated the overall structure of the courses somewhat lower, but nonetheless positive. However, the authors feel that evaluation and planning must be an integral part of any sound introduction to microcomputers.

Two other evaluations were conducted as part of the three-semester-hour courses. One was in the form of a questionnaire in which participants rated the MicroSOFT and Open-Ended Checklist procedures. The other evaluation was an assessment of the participants' technology background. Copies of the evaluation forms may be obtained from Peter Gray.

Table 2 summarizes the responses to the software evaluation questionnaire. The responses show that both the MicroSIFT and Open-Ended Checklist procedures were overall positively rated. The only dramatic difference is in regard to their use by teachers, the last item in Table 2. The Open Checklist had more positive ratings on this item than did the MicroSIFT process. This may be due to (1) the Open-Ended Checklist's format, which encourages its use as an observational tool useful in planning instruction, and (2) the complexity of the MicroSIFT form, and the requirements of consensus as part of the process, which make it less useful as a planning instrument. It is recommended that

both a formal screening process and a process which will facilitate instructional planning be included in any introduction to microcomputers for educators, since both of these tasks are necessary for the appropriate inclusion of microcomputers into educational instructional settings. Administrators should also be provided with a systematic process for evaluating courseware relevant for their use.

Table 1
Average Participant Ratings of the Four Computer Plus Courses

Items	Average Ratings: Micros in Education	Micros in Instruction	Micros for Classroom Use	Admin. Uses of Micros
1. The presenter(s) seemed knowledgeable	3.6*	3.8	3.6	3.6
2. The instructional materials were a useful part of the workshop	3.7	3.7	3.5	3.6
3. The hands-on activities were appropriate	3.8	3.9	3.6	3.8
4. I will be able to use the information presented in this workshop	3.7	3.7	3.6	3.6
5. The workshop was well structured	3.2	3.5	3.0	3.5
6. The workshop was worth my time	3.7	3.8	3.3	3.7

*On a scale of 1 to 4 where
1 = strongly disagree
2 = disagree
3 = agree
4 = strongly agree

Table 2
Software Evaluation Questionnaire
Summary

	SA* 4	A 3	D 2	SD 1	$\bar{x}$ (N=26)
1. Purpose is clear					
MicroSIFT	12**	13	1	0	3.4
Open Checklist	4	20	2	0	3.1
2. Achieves its purpose					
MicroSIFT	9	16	1	0	3.3
Open Checklist	2	22	2	0	3.0
3. Useful					
MicroSIFT	10	15	1	0	3.35
Open Checklist	2	20	4	0	2.9
4. Forms were clearly written					
MicroSIFT	7	17	2	0	3.35
Open Checklist	3	20	3	0	3.0
5. Teachers can easily use					
MicroSIFT	5	0	17	4	2.2
Open Checklist	3	18	5	0	2.9

* SA=Strongly Agree; A=Agree; D=Disagree; SD=Strongly Disagree
** Frequency of responses

Participants' perception of their level of microcomputer use ("poor," "adequate," "very well") were gathered at the beginning and at the end of the three-semester-hour courses. Sixty-eight percent (68%) of the one-week course participants and 70% of the three-week course participants rated themselves higher at the end of the course than at the beginning. They typically moved from "poor" to "adequate" in terms of their level of use of microcomputers.

Since a major purpose of the Computers Plus Program was to develop competent and confident microcomputer users, it is gratifying to see a consistent, positive change in participants' attitudes toward their use of microcomputers.

In conclusion, there are five lessons that we have learned from the organization and operation of the Computers Plus Program.

1. Start planning early. This is the only way to gather the resources and the organizational commitment necessary to make such a program successful.

2. Delegate responsibility. Designate one person who is responsible for administrative aspects, another person who is responsible for organizational aspects, such as gaining program approval and setting up a computer laboratory, and a third person who is responsible for the curriculum and the resources (i.e., of people and material) that are needed to implement the curriculum.

3. Provide the greatest variety of experiences possible for participants. This should include instructional materials, software materials, and outside presenters.

4. Present a balance between the review of software and the presentation of concepts and issues related to the evaluation of microcomputer materials, and planning for microcomputer use.

5. Include many opportunities for participants to meet and work with each other, so that networks can be established which will sustain them once they have gone back into their own educational setting.

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APPENDIX A

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. A-468 PORTLAND, OREGON

POSTAGE WILL BE PAID BY ADDRESSEE

School of Education
University of Portland
5000 N. Willamette Blvd.
Portland, OR 97203-5798

33

The University of Portland School of Education

Degrees in elementary and secondary education have been offered by the University of Portland since 1949. The School of Education was established in 1962 and currently offers programs for State and standard certification with the bachelor's or master's degree. Certification and endorsement programs in reading, handicapped learner, religious education, early childhood education and coaching are offered in addition to the regular endorsements.

The School of Education is accredited by the Oregon Teacher Standards and Practices Commission and the National Council for the Accreditation of Teacher Education, and receives further recognition by the University of Portland's accreditation from the Northwest Association of Schools and Colleges. The school is a member of the American Association of Colleges for Teacher Education, the Association of Teacher Educators, and the American Educational Research Association.

The Staff

Peter Gray, Ph.D. - Program Director, Research Associate with Northwest Regional Educational Laboratory.

Jonathan Tafel, Ph.D. - Program Coordinator, Assistant Professor, The University of Portland School of Education.

Carl Schefsky - Special consultant, Instructional Media Center, The University of Portland.

Judith B. Allen, Ph.D. - (Guest Speaker) Director, Technology Center for Training and Demonstration at NW Regional Educational Laboratory.

Northwest Regional Educational Laboratory

The Northwest Regional Educational Laboratory is a private, non-profit organization that helps education, government, community agencies, business and labor to improve the quality and equality of educational programs and processes.

The NWREL was organized and established in 1966 by representatives of various levels of education in the Northwest. Six states and four United States territories in the Pacific are affiliated with NWREL.

In 1982 the Technology Center for Demonstration and Training began to provide technical assistance and training in the educational uses of technology, including microcomputers. "The Use of Technology" is currently one of nine programs sponsored by NWREL.

THE UNIVERSITY OF PORTLAND
5000 N. Willamette Blvd.
Portland, OR 97203-5798

THE UNIVERSITY OF PORTLAND

School of Education

Presents

COMPUTERS PLUS

A Program in Microcomputers for Education

Offered

Summer 1983

In cooperation with

Northwest Regional Educational Laboratory
300 S.W. Sixth Avenue
Portland, Oregon 97204
Telephone (503) 248-6800

The Changing Scene

A recent report of the National Center for Educational Statistics says "the number of microcomputers available for instructional use in public schools tripled between fall 1980 and spring 1982," – from about 30,000 to nearly 100,000. It is predicted that by 1985 there will be 270,000 microcomputers in public schools.

Teachers, school administrators, and support staff can feel bewildered and overwhelmed by this rapid advance of electronic technology.

The "Computers Plus" program will ease your anxiety about microcomputers by giving you the background and experience needed to successfully plan for and use microcomputers in school settings.

"Computers Plus"

Computers Plus is a multi-faceted program offered by The University of Portland School of Education in cooperation with the Technology Center for Training and Demonstration at the Northwest Regional Educational Laboratory.

Participants will earn university credit while learning to use microcomputers in their teaching and administrative assignments.

Computers Plus offers:

- -A broad range of topics including the demystification of microcomputers, the use of microcomputers in teaching mathematics, English, science and other subjects, the use of word processing in management and instruction, and the special use of microcomputers for art, music, recordkeeping, testing, I.E.P. development and more.
- -A computer faire featuring microcomputer vendors and computer user groups.
- -An experienced staff of instructors, consultants, and guest speakers.
- -A fully equipped and staffed laboratory for individual instruction and hands-on experience.
- -An individual project to develop a diskette of programs for personal use.

In addition, low-cost housing is available on a daily basis on the beautiful U. of P. campus. Breakfast, lunch and dinner can be purchased on a meal ticket plan and a small coffee shop is available.

The 92-acre campus is located in a quiet, residential neighborhood on a bluff overlooking the Willamette River – ten minutes from Portland city-center and little more than an hour from both the Cascade Mountains and the Pacific Ocean in the scenic heartland of the Pacific Northwest.

Microcomputers in Education

June 20-24 — 3 semester hours
8 a.m.-4:30 p.m., M-Th — 8 a.m.-12 noon, Fri.

An intensive introduction to the use of microcomputers in education.

- Judith E. Allen, Director NWREL Computer Technology Program, keynote speaker
- Wine and cheese socials to exchange ideas
- Computer faire with vendors
- Fully equipped computer lab session
- Dinner session with guest speaker
- Demonstrations by specialists
- Personalized instruction

Microcomputers for Classroom use

June 27 - July 15 — 3 semester hours
8 a.m.-11 a.m. — Mon.-Thur.

Three week beginner course in basic competencies and programming for classroom use.

- Individualized attention
- One-to-one computer use
- Selection and evaluation of hardware
- Specialized use of microcomputers in classrooms

Microcomputers in Instruction

June 24 & 25 — 1 semester hour
1 p.m.-7 p.m., Fri. — 8 a.m.-5 p.m., Sat.

A weekend workshop showing the special uses of microcomputers for instruction.

- Art
- Music
- Special Education
- Graphics
- Hands-on Experience

Administrative Uses of the Microcomputer

July 8 & 9 — 1 semester hour
8 a.m.-4:30 p.m. — Fri. & Sat.

A weekend workshop that will deal with the microcomputer and:

- Recordkeeping
- Reports
- Scheduling
- Grade Recording
- Word Processing
- Inventory

Special Features of a "Computer Plus" Summer

*A chance to earn credits in a program of short courses and workshops while enjoying the scenic City of Roses and the Pacific Northwest
*Inexpensive on-campus lodging and meals
*Software program demonstrations
*Staffed computer laboratory
*A program designed for novice computer users
*Materials and reference library
*An opportunity to develop a disk for personal classroom use

NAME

ADDRESS

CITY STATE ZIP

SCHOOL CITY STATE

HOME PHONE WORK PHONE

Please enroll me for the following:

- ☐ Microcomputers in Education — Cost: $371* — $_____
- ☐ Microcomputers in Instruction — Cost: $124* — _____
- ☐ Microcomputers for Classroom Use — Cost: $371* — _____
- ☐ Administrative Uses of the Microcomputer — Cost: $124* — _____

SUB TOTAL _____

- ☐ *Less 5% discount for pre-registration by May 15* — _____

SUB TOTAL _____

Please reserve the following for me:

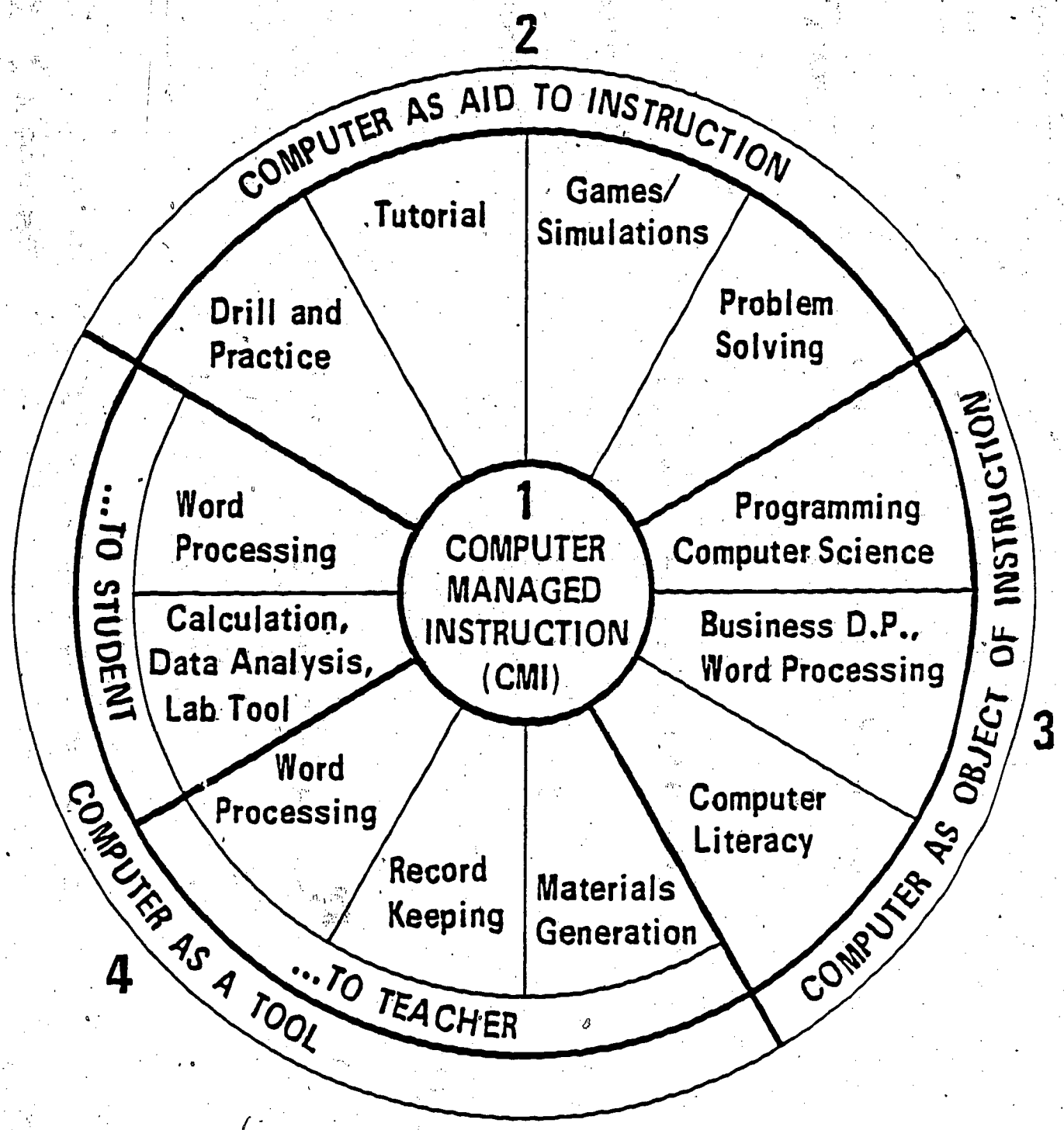
- ☐ I will have one guest for the Thursday dinner session ($8 extra). — _____
- ☐ Single room @ $12/night — _____
  Dates: _____
- ☐ Double Room @ $9/night — _____
  Dates: _____
- ☐ Meal Ticket @ $9/day (breakfast, lunch, dinner) — _____
  Dates: _____

TOTAL $_____

- ☐ $25 Required Deposit Enclosed
- ☐ Bill me for Balance
- ☐ Check enclosed for Total
- ☐ Undergraduate Credit
- ☐ Graduate Credit

* Includes Materials Fee

THE ROLES OF THE COMPUTER IN THE CLASSROOM



FIVE AREAS OF ADMINISTRATIVE USE

MICROCOMPTERS IN EDUCATION

1. One of the most popular uses of microcomputers is WORD PROCESSING. The notion of creating and storing text material, editing and formatting that material, and then printing it out holds a lot of interest to those responsible for generating and handling a great deal of paper.

2. A SPREAD SHEET program allows the user to build an electronic version of a paper sheet with large numbers of rows and columns. Relationships among these can be defined and cummulative calculations performed automatically. An excellent example of a spreadsheet application would be the generation of a salary schedule. Here the base salary figure can be changed with all resulting changes in the schedule being performed and displayed almost instanteously.

3. DATA-BASE MANAGEMENT refers to programs designed to help enter, edit, organize, and retrieve stored information. Generally, these programs are very flexible and allow the generation of a variety of reports.

4. TELECOMMUNICATIONS programs allow the computer to be connected to a telephone line (with the appropriate hardware). Then, communications with other computers is possible. Large information bases (such as RICE [Resources In Computer Education]) can be accessed. In addition, electronic mail and other forms of information transfer can be obtained.

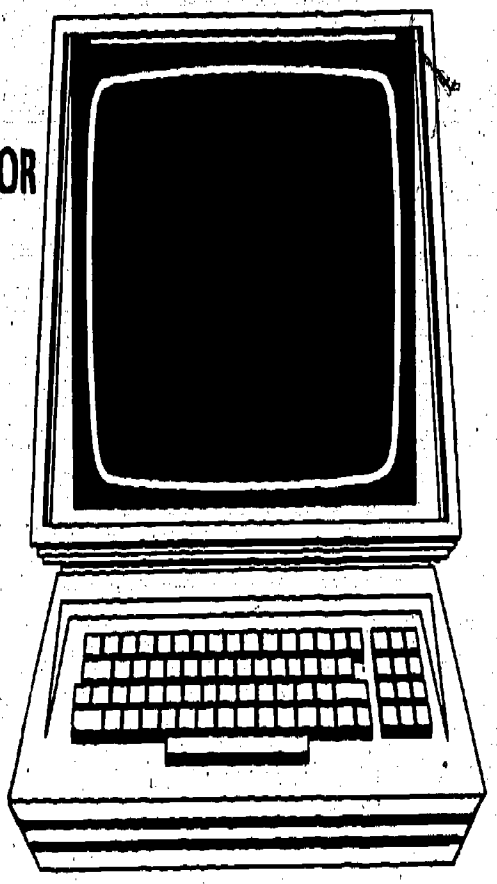
5. SPECIAL FUNCTION programs are directed at accomplishing specialized tasks. Unlike the more general programs mentioned above, these programs usually take on very specific objectives such as scheduling, attendance, inventory. What these programs lack in flexibility they make up in terms of power.

NWREL Technology Center
7/83

ADMINISTRATIVE APPLICATIONS

PERSONNEL	Personnel Records Payroll Salary Simulation
FINANCE	General Accounting Petty Cash Accounts Receivable Vendor Reports General Ledger
STUDENT	Daily Attendance Mark Reporting Scheduling Assistance Student Records Enrollment Projection
MISCELLANEOUS	Mailing Lists, Labels Information Retrieval Word Processing

MICROCOMPUTER STATION

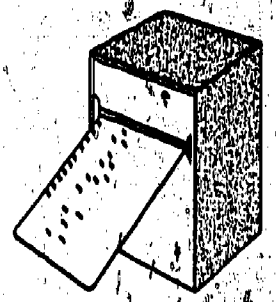


MONITOR

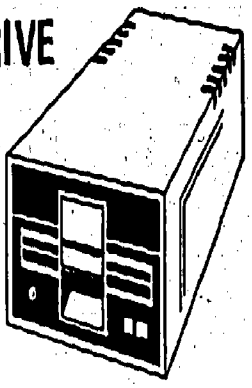
PROCESSOR

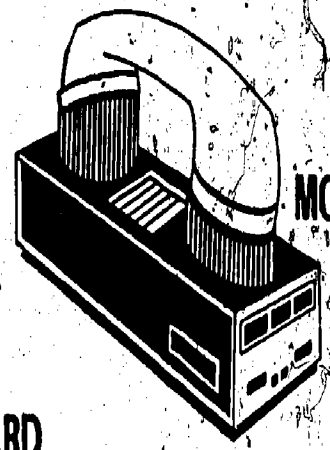
KEYBOARD

MARK SENSE READER

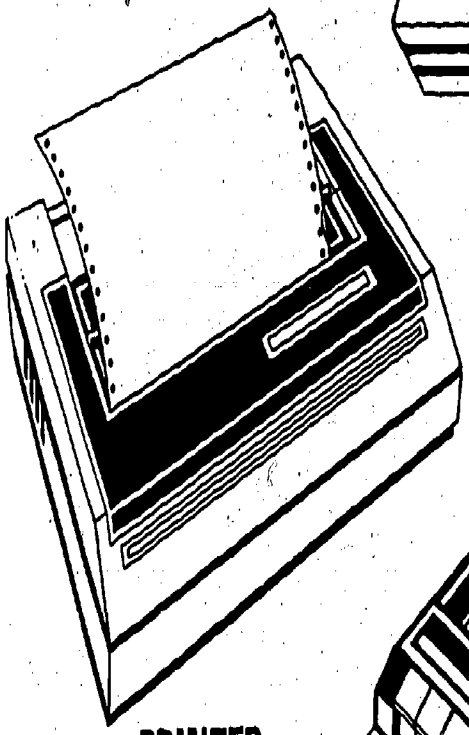


DISK DRIVE

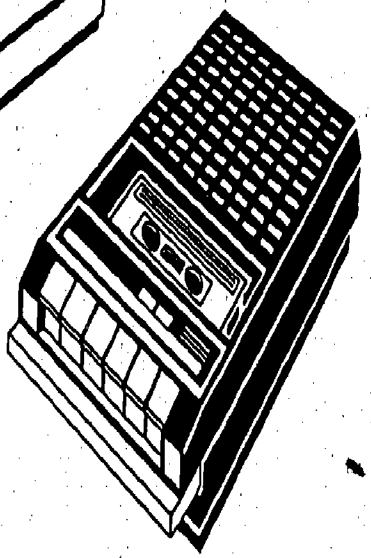




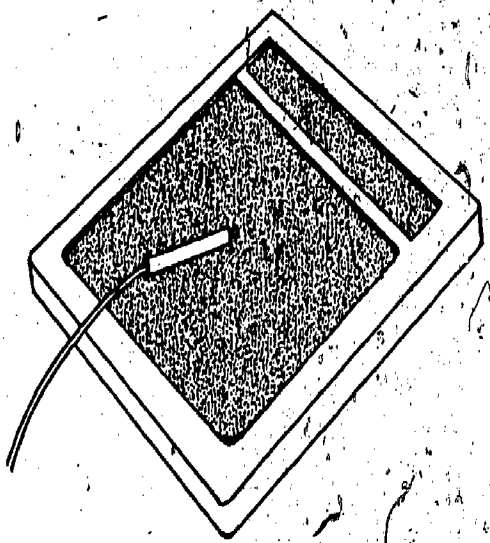
MODEM



PRINTER



CASSETTE TAPE RECORDER



GRAPHIC TABLET

APPENDIX B

MICROCOMPUTERS PLUS

Outline of One-Week Course

Microcomputers in Education

Monday, June 20, 1983		
7:30-8:30 a.m.	Registration	BC 103
8:30-9:00 a.m.	Welcome Introduction of Staff	BC 206
9:00-9:30 a.m.	Discussion of course outline, requirements and resources	BC 206
9:30-9:45 a.m.	Break and split into two groups	
9:45-11:30 a.m.	Group A: Technology Questionnaire "Who Am I?" Exercise Three uses of computers in education -CAI -Computer Literacy -Administrative Tasks	BC 206
	Group B: Demystifying the computer System commands	BC 103
11:30-12:30	LUNCH	
12:30-2:15 p.m.	Group A: Group B:	BC 103 BC 112
2:15-2:30 p.m.	Break	
2:30-3:30 p.m.	Group A: Identification of Unit Topic	BC 112
	Group B: Word Processing concepts and tutorial	BC 103
3:30-3:35 p.m.	Switch rooms	
3:35-4:35 p.m.	Group A: Group B:	BC 103 BC 112
4:35-4:40 p.m.	Group A and Group B	BC 112
4:40-5:00	Discussion groups to share topics	BC 112
5:00-6:00	Wine and Cheese	Terrace Room, Commons

Tuesday, June 21, 1983

8:00-8:25 a.m.	Overview of software evaluation criteria and MicroSIFT process	BC 206
8:25-8:30 a.m.	Break into groups	
8:30-9:45 a.m.	Group A: Review Courseware	BC 103
	Group B: Consideration of what mades good software	BC 206
9:45-10:00 a.m.	Break and switch rooms	
10:00-11:30 a.m.	Group A: What makes good software?	BC 206
	Group B: Review courseware	BC 103
11:30-12:30	LUNCH	
12:30-1:30 p.m.	Group A: Data Base management	BC 112
	Group B: Continue reviewing software	BC 103
1:30-1:35 p.m.	Break and switch rooms	
1:35-2:35 p.m.	Group A: Review software	BC 103
	Group B: Data Base management	BC 112
2:35-2:40 p.m.	Break and switch rooms	
2:40-3:40 p.m.	Group A: Computer literacy	BC 112
	Group B: Data Base practice	BC 103
3:40-3:45 p.m.	Switch rooms	
3:45-4:45 p.m.	Group A: Data Base practice	BC 103
	Group B: Computer literacy	BC 112
4:45-5:00 p.m.	Debrief day	

Wednesday, June 22, 1983		
8:00-8:30 a.m.	Indepth evaluation procedures	BC 206
8:30-9:30 a.m.	Guest presenter: Carol Imscher (Computer managed instruction)	BC 206
9:30-9:45 a.m.	Break and go to rooms	
9:45-11:45 a.m.	Group A: Review materials	BC 206
	Group B: Review software and lunch	BC 103
11:45-12:45	LUNCH	
12:45-2:45 p.m.	Group A: Review software	BC 103
	Group B: Review materials	BC 112
2:45-3:00	Break	
3:00-4:00	Group A and Group B: Guest presenter: Ethlyn Holmes (Courseware concerns)	BC 112
4:00-6:00 p.m.	Additional courseware and materials review	BC 112
Thursday, June 23, 1983		
a.m. and p.m.	My favorite software: presentations by consultants, instructors, and participants	BC 206/112
6:00-8:00 p.m.	Dinner with guest speaker: Judith Edwards-Allen	Terrace Room, Commons
Friday, June 24, 1983		
8:00-8:30 a.m.	Getting organized	BC 206
8:30-11:30 a.m.	Poster sessions by participants on their units	BC 206
11:30-12:00	Course evaluation - Final words	BC 206

MICROCOMPUTERS PLUS

Outline of Weekend Course

Microcomputers in Instruction

Friday, June 24, 1983

12:15-1:00 p.m.	Registration	BC 103
1:00-1:30 p.m.	Welcome and introduction of staff Discussion of course outline requirements and resources	BC 206
1:30-2:00 p.m.	Technology questionnaire "Who Am I?" exercise	BC 206
2:00-2:15 p.m.	Break and move to computer lab	BC 103
2:15-4:00 p.m.	Demystifying the computer system command	BC 103
4:00-4:15 p.m.	Break	
4:15-5:15 p.m.	Three uses of computers in education -CAI -Computer literacy -Administrative tasks	BC 103
5:15-6:15 p.m.	DINNER	
6:15-7:00 p.m.	Software evaluation concepts	BC 206

Saturday, June 23, 1983

8:00-8:30 a.m.	Getting organized	BC 206
8:30-11:30 a.m.	Presentations by consultants, instructors and participants	BC 206/103
11:30-12:30	LUNCH	
12:30-3:30 p.m.	Presentations	BC 206/103
3:45-4:45 p.m.	Planning for Microcomputer Use	BC
4:45-5:00 p.m.	Course evaluation	BC

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Outline of Three-Week Course: Microcomputers for Classroom Use

Monday (June 27, 1983)

8:00-9:00 Class (Rm. BC 209)
- Course outline, requirements, and resources

Technology Questionnaire

"Who Am I?" exercise

9:00-11:00 Lab (Rm.103)
- Demystifying the computer
- System commands

Assignment

Tuesday (June 28, 1983)

8:00-9:00 Class
- Three uses of microcomputers
  - -CAI
  - -Computer Literacy
  - -Administrative Tasks

9:00-11:00 Lab
- Word processing
- Concepts and tutorial

Assignment
- Chapters

Identification of unit topic

Wednesday (June 29, 1983)

8:00-9:00 Class
- MicroSIFT evaluation process
- Formation of Teams
- What makes good software?

9:00-11:00 Lab
- Software Evaluation

Assignment

Thursday, (June 30, 1983)

8:00-9:00 Class
Computer Literacy
Indepth Evaluation

9:00-11:00 Lab
Software Evaluation

Tuesday-Thursday (July 5-7, 1983)

8:00-10:00 Class
Special topics by guest presenters
(e.g., music, special education, graphics, LOGO)

10:00-11:00 Lab
Software Evaluation/Materials Review

Monday (July 11, 1983)

8:00-9:00 Class
Data base management concepts

9:00-11:00 Lab
Data base practice
Software Evaluation

Tuesday (July 12, 1983)

8:00-9:00 Class
Visicalc concepts

9:00-11:00 Lab
Visicalc practice
Software Evaluation

Wednesday/Thursday (July 13-14, 1983)

8:00-9:00 Lab
Software review

9:00-11:00 Class
Student presentations

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Administrative Uses of Computers
Weekend workshop

Friday (July 8, 1983)

8:00 - 9:00	(Room BC 314) Introduction Data Base Form Technology Questionnaire Getting Acquainted
9:00 - 9:45	Demystifying the computer
9:45 - 10:00	Break and move to computer lab
10:00 - 11:30	System Commands (Room BC 103 - Lab)
11:30 - 12:30	Lunch (on your own)
12:30 - 1:45	Overview of Educational Uses of Computing (with demonstrations) - CAI - Computer Literacy - Administrative Computing
1:45 - 2:00	Break
2:00 - 3:10	Group A: Word Processing (Lab) Concepts and Practice Group B: Presentations (Rm 314)
3:10 - 3:20	Break and switch
3:20 - 4:30	Group A: Presentations (Rm 314) Group B: Word Processing (Lab)

End of day 1.

Saturday (July 9, 1983)

8:00 - 8:15	(Rm 314) Getting organized
8:15 - 9:45	Group A: Data Base Management (Lab) Concepts and Practice Group B: Presentations (Rm 314)
9:45 - 10:00	Break and switch
10:00 - 11:30	Group A: Presentations (Rm 314) Group B: Data Base Management (Lab)
11:30 - 12:30	Lunch (on your own)
12:30 - 1:50	Group A: VisiCalc (Lab) Concepts and Practice Group B: Presentations (Rm 314)
1:50 - 1:55	Break and switch
1:55 - 3:15	Group A: Presentations (Rm 314) Group B: VisiCalc (Lab)
3:15 - 3:30	Back together (Rm 314)
3:30 - 4:20	Organizing for Microcomputer Use in School Districts
4:20 - 4:30	Workshop Evaluation

End of day 2.