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ABSTRACT

Recent developments in Northwestern University's Computer Aids to Teaching Project are reviewed in the first section of this issue. Included are pieces of information about the use of the PLATO IV system, and about increasing access to System Development Corporation's Educational Resources Information Center (ERIC) files, along with news about personnel, facilities and equipment changes relating to the Project. The second half of the newsletter offers an article which outlines some of the concepts and issues facing designers of computer-based learning/information exchanges. It reviews briefly some of Ivan Illich's basic ideas for de-schooling society and for building dynamic learning webs in which teachers and students come together as their needs and interests dictate. In addition, it touches upon the role of the computer in such a system, the types of information found in the system, and some possible means of financing such endeavors. (LB)

Computers And Teaching
An Interactive Newsletter

Northwestern University - Computer Aids to Teaching project

7
October
1973

VARIOUS NEW THINGS

The Computer Aids to Teaching project enters its second year this month. The first year was spent obtaining equipment, preparing the HYPERTUTOR system on our computer and training a number of professors and students in Computer-Aided-Instruction programming.

The second year of the project will have a slightly different emphasis, with a corresponding shift in budget and staff allocation. During the upcoming year we will concentrate on maintaining working relationships between the project and the faculty members who are using C.A.I. (or its cousins, interactive simulations and the like) in courses this year. Ten classes are now scheduled to use one or the other of our available computer systems this year. We will provide expert help with the design, implementation, debugging and testing of C.A.I. lessons for these classes.

Anyone not currently working with one of our staff members may call (5367) for an appointment to discuss your C.A.I. application.

PLATO

Use of PLATO-IV will continue through the year. Three PLATO-IV terminals are on order now. Two of these will be immediately put to use by the project; the third is available for any department or school which can scrape up the cash to pay for it ($6,000 plus $2,000 per year in telephone charges).

One or more of these terminals will be connected to the CDC 6400 computer at Northwestern. The others will be on a switch allowing either Urbana (PLATO) use or Northwestern use.

All terminals are expected to arrive in February, 1974.

E.R.I.C.

We now have access to System Development Corporation's ERIC (Educational Resources Information Clearinghouse) files via a computerized information retrieval system. It is open to all faculty and students on request. For the moment, any "reasonable" number of searches will be free. At some time in the future, we will begin charging, and the system will be available for public use in our workroom -- searches will then cost about $5.00 each, depending upon their extent.

The use of an on-line system, such as SDC's, should be contrasted with off-line or batch systems, such as that being implemented by the Northwestern University Library. The batch system is best for a search which can be fairly well specified in advance from the Thesaurus of ERIC Descriptors. However, when a user is not sure which categories his information falls into, he may wish to perform on-line searches, revising his search strategy as articles are retrieved.

You may contact the project office for more information about SDC-ERIC, or you may attend the E70 meeting in which we will discuss its use (Monday, October 29, 6:30 p.m.,room 1-308).

You may also contact Don Black at SDC, 2500 Colorado Ave., Santa Monica, CA, 90406, about obtaining your own access to SDC-ERIC. There's no monthly minimum charge (a welcome breath of fresh air after most time-sharing services' $100 monthly minimum), so it's well worth signing up for, even if you only use it a few times.

WORKROOM

Slight changes have been made in the project workroom. An Evanston/Chicago phone (492-5517) has been installed for use by students, and an additional phone is used to connect the PLATO terminal to our computer. Drawers in that room are still available for use by active HYPERTUTOR or PLATO programmers.

The workroom will generally be open from 10 a.m. to 10 p.m. Monday through Friday this quarter. Saturday hours will vary (call 492-5517 on Saturday to find out whether anyone's there). A list of evening hours will be posted on the workroom door, indicating the evening hours and any changes in our schedule.

THE AWFUL ANSWERING MACHINE

If you thought that getting used to the computer was hard, just try getting used to a telephone-answering-machine! Most of the time project staff members are busy with students or faculty members, and we've been really difficult to reach by telephone. But, now we have a tape-recorder which answers our phone when nobody's at home. If you reach the awful machine, please leave your name and phone number so that we can call you back.

NEW PEOPLE

A number of new faces will be seen in our domain this year. Each of these people will be available to aid you in some way:

Dale Jessen: Dale concentrates upon the computer aspects of the C.A.T. project, and will be interfacing HYPERTUTOR and the PLATO-IV terminal. He is one of the best all-around sources of information about the Northwestern computer system.

Pete Fairweather: Pete worked with some C.A.I. lessons in the field of reading this summer, and has been made a full-time assistant for the next year. He is extremely good at C.A.I. lesson-writing, and is primarily interested in education. He will be working with C.A.I. users in education and related fields this year.

Dick Walz: Dick has been promoting computer uses for years and was an early user of the on-line system. Dick is strong in the areas of simulation and planning, and is an experienced programmer. He will be working primarily with C.A.I. users in Tech and Economics.

Bruce Breuninger: Bruce works part-time with the C.A.T. project, devoting his energies to the Political Science department. He has developed a general statistics lesson (statistical tests, hypothesis testing), for use by students from any department.

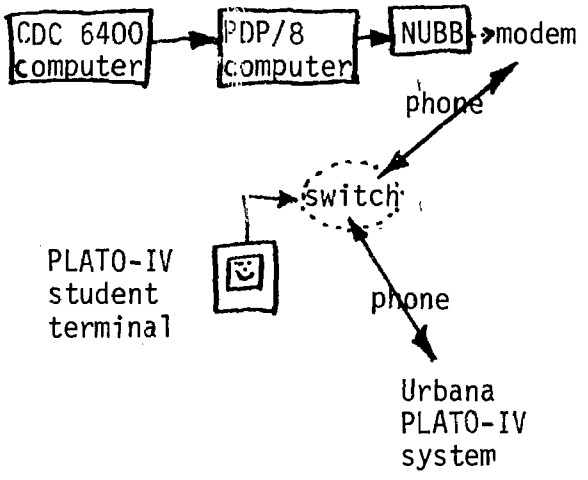
Richard Fisher: Rich is well known to frequenters of the workroom as "that guy that's always there". This year he will be working part-time to improve and maintain the HYPERTUTOR interpreter. He also knows everything there is to know about PLATO-IV.

A number of students are available thru the C.A.T. project for programming jobs, on an hourly basis. All of the people listed above may be reached at 492-5367.

THE NUBB OF THE MATTER

Greg Suski has finished construction of the Northwestern University Black Box (the NUBB).

A NUBB is a device which converts 8-bit ASCII-type codes into codes acceptable to the PLATO-IV student terminal, and vice-versa. In our case it is physically installed at the computer-end of a telephone line, and acts as the interface between a PDP/8 and the terminal. The diagram below illustrates that configuration.



Cost of the NUBB is estimated at $1200 to $1600. A prototype is now in operation.

A new version of the HYPERTUTOR is now being written, to drive the terminal from our CDC 6400. It will supply full graphics, slide control and touch-panel input. Audio will be inserted when the equipment becomes available. Potential users should note that there is a substantial amount of software (programs) involved in the support of this terminal. The PDP/8 (in our case) has to echo all characters to the terminal, as well as recognizing "sub" and "sup" so that it can position characters properly on the screen. The CDC 6400 computer only recognizes 63 characters in its standard configuration, and it is necessary to implement an extended character set to reproduce the full range of PLATO-IV characters. All of this takes programming time. We expect to have a completed version of HYPERTUTOR for the PLATO terminal by late November, 1973.

PLANIT

PLANIT is the Programming LANguage for Interactive Teaching. At a recent workshop at Purdue University, we obtained a magnetic tape containing the full PLANIT system. It will be available on the 6400 some time this fall quarter, for tests by potential authors.

PLANIT contains an interactive course creation editor which aids the author in lesson-writing. It appears to be economical (in terms of computer time used), but requires a large amount of the computer's central memory -- we will have to perform exhaustive tests to determine how it functions with respect to the HYPERTUTOR.

The PLANIT Author's Guide is available in the C.A.T. Project office (1-126) for those who wish to examine this widely-used programming language.

Suggested reference: "PLANIT- A Language for C.A.I.", Datamation, Vol. 14, No. 9, September, 1968, pp. 41-47

FUNDING SOURCES

Robert F Acker, Director of Federal Program Development at Northwestern, will present some ideas on funding sources for C.A.I. work at a meeting Monday, October 15, 4:00 p.m. in the project office (or in a suitable classroom if attendance warrants). The meeting is open to all faculty members currently anticipating C.A.I. development of their own.

Circle this date! Room 1-126

E70 SEMINAR

The E70 Seminar sessions will be open to anyone interested in participating. Off-campus visitors, please call us to reserve a place in any single session you may wish to attend.

Oct. 8 (Monday, 6:30 p.m. room 1-308)
(Video taped) Introduction to the PLATO-IV system, hardware and software. (Participants may elect to play the video-tape at their own convenience during the week.)

Oct. 15 (6:30 p.m.) and Oct. 22
Planning and writing C.A.I. lessons. Topics from Hicks & Hunka The Teacher and the Computer.

Oct. 29 (6:30 p.m.)
Information retrieval as a teaching tool. Introduction to ERIC system and Learning Disabilities simulations.

Nov. 5 (6:30 p.m.)
Computerized conferencing.
Video-tape of journalism students' encounter with the computer.

Nov. 12 (6:30 p.m.)
Simulations in biology and social studies as teaching tools.

Nov. 19 (6:30)
open

Nov. 26 (6:30)
Recapitulation of workshop on the design of a computer-based living/learning exchange. (See article)

VIDEOTAPES

We have begun our library of short-subjects on video tape, to be augmented by slide-shows at a later date. The first two tapes cover R.I.Q.S. (The information retrieval system) and the HYPERTUTOR. They are short (20 min.) demonstrations.

The C.A.T. project slide-show, which is full of introductory material, is being used about once a week now, and is also available for showing to groups of students upon demand.

HIGH SCHOOLS

Evanston Township High School is beginning a program which will use the computer in chemistry classes this fall. The lessons will be in the drill-and-practice mode, and will be run on two Teletypes at the high school.

We are currently looking for students who might be interested in helping with this project.

DATA MONITORING

A new lesson, "DATA" has been added to the HYPERTEXT, with a number of additional variable names to give useful information. This lesson reports the total time spent in the last student lesson, the amount of computer time used, its cost, the cost of connect-time and projects these figures to an hourly rate. This is also done for the student job as a whole. The DATA lesson may be run after any other C.A.I. lesson.

Authors who are interested in obtaining average execution costs for their lessons may contact us to request monitoring of the execution times of their lessons.

GUIDE TO HYPERTUTOR

The Complete Guide to HYPERTUTOR is again in print. There are a few minor modifications in command specifications and some additions.

Published by:

Computers And Teaching, Northwestern Univ.
2003 Sheridan Road
Evanston, Illinois 60201

Jointly administered by the Center for the Teaching Professions and the Vogelback Computing Center.

A Computer-based

INFORMATION EXCHANGE

This article outlines some of the ideas and issues facing designers of computer-based learning/information exchanges. The idea of a "learning web", an information network to be used by learners and teachers in a de-schooled society, was advanced by Ivan Illich [1], in 1969. He proposed that such webs be able to link teachers with learners and learners with learners, perhaps going so far as to arrange a rendezvous. Illich recognized immediately the potential of electronic computers for storing and matching the requisite information. Silber [2], outlined a plan for a community-wide learning system which would include a computer system as the coordinating device. During 1973 a number of people have been planning or implementing such systems. Because computer based communications is such a new field, I will be stressing its advantages and disadvantages throughout this article.

BACKGROUND

In Deschooling Society, Ivan Illich argues that many of the world's problems are directly attributable to its educational structure, the school. Like other critics of the schools, Illich feels that schools (and teachers) stifle creativity, reward conformity and generally botch up the job they were commissioned to do. But, unlike other critics, Illich argues that it is the institution of "school" itself that is the source of the trouble, and that the school must be abandoned in favor of more "convivial" learning situations.

Many of Illich's critics take him to task for suggesting that the solution to the problem is the abolition of schooling. Most of them have been searching for alternatives within the system, and don't see how such a radical de-structuring as Illich suggests could be brought about without total chaos ensueing [3].

Illich *did* propose a model for learning which could replace schools, and it is unfortunate that his critics have chosen to concentrate on the unworkability of his utopian plan rather than trying to use some of the structures he outlined. The structure he proposes is the "learning web" (now more popularly called "learning exchange"). A learning-web is a network of people and information within which learners may work. In one way it is like a giant library in which people (as well as books and other resources) are catalogued. Much like a library, most learning exchanges use card catalogues to keep track of their resources.

But, Illich proposes even more. He sees the learning web as a dynamic catalog -- changing with the people who use it. It would possess the ability to schedule meetings between people who were interested in learning about or discussing specific topics. A small community could accomplish this with a bulletin board and a card catalog -- a large community might need more powerful indexing devices, such as the computer.

The Evanston, Illinois, Learning Exchange was formed several years ago by a group of students interested in testing this idea. They catalogued the abilities of each member of the group and placed this information on file. As time went by, the listing expanded and the Learning Exchange went into full-time operation. The exchange now lists thousands of people with specific skills they are willing to teach. Listings are contained in several card files. Community members call one of a number of telephones at the exchange,

are given the name and phone number of a potential match for their interest, and must then make contact on their own.

Silber's model is based upon the concepts developed above. His "Learning System" would be highly reliant upon a central computer which would hold the information currently kept in card files. This computer would be able to match teachers and learners based upon a hierarchy of subject-matter descriptions. In addition, the computer would make appointments for the teachers. Once teacher and learner had met, they would set learning-objectives to be met and would record these in the computer for future reference. At the end of the learner/teacher encounter, evaluation data would be recorded by the computer and linked to both teacher and learner characteristics. Thus, future learners would be able to determine which of a number of teachers might be best for their specific learner-characteristics (age, sex, intelligence, experience, ...). Such data would rapidly swamp a manually-operated learning exchange. (In fact, this question of evaluation of the learner/teacher encounter is being hotly debated at this moment; should there be evaluation or not?)

THE COMPUTER

The computer is really proposed only as a coordinating device for the exchange. Some people think the student should be in direct contact with the computer, and others feel that the presence of a human mediator (not a programmer, but more of a counselor) is necessary.

There are many reasons the computer is proposed, however. First, it can coordinate much more data than a human, in a given amount of search-time. The computer is also instantly available to a number of users -- a card catalog has a limited surface area, and only one or two people may be using it at a time.

A computer-terminal, which may look like an overgrown typewriter with a television set on it, could be located anywhere a telephone is available, and connected to the computer by phone whenever a learner requests information This effectively makes the catalog of learning-resources available anywhere a computer terminal is available. The computer programs may be capable of searching through thousands of items in a second or two, thus making more complete and precise matches than a human could.

However, the computer doesn't have the ability to help a learner with a request which is imprecise. And it doesn't have the ability to associate one item of information with another on the spur of the moment, unless that association was previously noted by a human user.

TYPES OF INFORMATION

System designers often attempt to specify in advance *all* categories of information or all modes of usage for their computer systems. This is the characteristic, and perhaps the most reliable way, of producing computerized systems. However, most of these systems are inflexible, and incapable of change if the "outside world" changes. Therefore, a computer-based exchange must be organized in the most general way possible.

As a hypothetical model, I will now propose a system to be implemented within a Computer-Aided-Instruction system, the HYPERTUTOR. The system will look almost like a card-file. Each "card" is called a "record", and contains a small amount of information (perhaps 640 characters as a maximum). Each record is associated with one or more "descriptors", which are words or phrases describing the content of the record. These may also contain cross-references to other descriptors. Information on teachers or other learning-resources is entered as records, classified by existing descriptors (if possible) and may then be retrieved by users.

For example, a guitar teacher may call us and ask to be listed in the exchange. We enter his name, phone number, address and other information into a single record. We then classify this record under "guitar", "classical guitar" and perhaps "music". Any descriptor which is new to the system will be automatically added to the descriptor list (and perhaps later revised by either a system supervisor or by student users).

Several classifications of information will be designed into the system. A "teacher record" will contain information on teachers or potential teachers. Each record will be filed under proper descriptors and may be retrieved by any user. But some information in a record may be protected (for instance, address might not be released to learners, but might be available for those people who are charged with updating the information stored in the exchange). A second type of record would be the "learner-record", stored by a user who wanted to find "learning peers" to work with him on a particular subject or project. As new teacher-records are added, searches might be made to find any learners who were entered before a teacher in the appropriate category was available. A third type of record would be the "message" or "bulletin" record. These are communications which use the computer as the storage and delivery medium. A "message" is always associated with a specific destination (usually a person's name, but sometimes a place) and are designated so that they may only be retrieved by the addressee. Bulletins, on the other hand, are classified by descriptors, and may be retrieved just as any other record. They might, for example, contain a notice of a guitar concert, which could be retrieved by any interested user.

FINANCING

It might be possible to finance an exchange by donations, but experience has shown this to be unlikely. The Evanston Learning Exchange, which serves a city of about 80,000 people, would cost roughly $24,000 per year to operate manually, and that is probably a low estimate of what it would cost to run as a computer-based system. Only a small percentage is donated. Therefore, an exchange must be self-supporting to run. One potential source of income is the teachers who list themselves and charge students for lessons. They can be asked to pay a small fee (perhaps a percentage of their first lesson) which could be roughly what it would cost to take out an ad in a newspaper. (This raises the question of what a computer-based exchange offers above and beyond the classified section of the Village-Voice.)

Users searching for learning-peers may also be asked for payment, since their records require as much work and storage space on the computer as those for teachers. Users who perform searches also require computer time during the search, but require no storage space. Therefore, some charge will probably be made for searching. Will the exchange bring enough satisfaction that a person would be willing to pay about what a good paperback would cost ($1.00 to 2.00)? Which would *you* choose?

QUESTIONS

These questions and many others will be raised (and some of them answered) at a day-long conference on computer-based learning exchanges. The conference will be directed at producing a design for systems to be developed in the Chicago area, and at exposing some already conceived designs (such as the one outlined above) to constructive criticism. The FEEDBACK card at the end of this newsletter is also a viable mechanism for responding to the ideas and questions asked here. Please respond!

Jim Schuyler JAS

(8.)

FORMAT

TYPE: { TEACHER / LEARNER / MESSAGE (PRIVATE) / BULLETIN (PUBLIC)

CONTENT:

DESCRIPTORS:

SECURITY: { USER TYPE= LOCAT=

CROSS REFERENCES:

RELATED RECORD #=

DESTRUCTION DATE: xx/xx/xx

USES SO FAR: xxx

CONTENT: Is free-form and may be altered by originator of record.
TEACHER-record - name, (address), phone, qualifications or comment
LEARNER-record - name, (address), phone
MESSAGE or BULLETIN - the message is the content

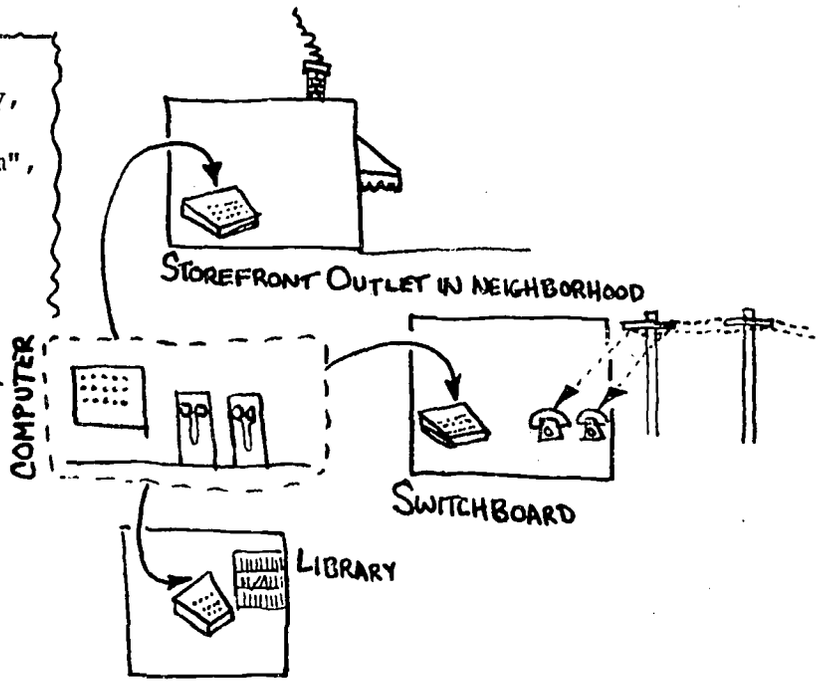
SECURITY: Record may only be retrieved by certain types or locations.
For instance, a BULLETIN for San Francisco might be tagged by location.

References:

[1] Ivan Illich, Deschooling Society, Harper & Row, New York, 1971

[2] Ken Silber, "The Learning System", Audiovisual Instruction, Sept., 1973

[3] After Deschooling, What?, Alan Gartner, ed., Harper & Row, New York, 1973



CONFERENCE

On Computer-based Learning/Living and Information Exchanges

Northwestern University
School of Education
2003 Sheridan Rd., Evanston, Il 60201

November 26, 1973

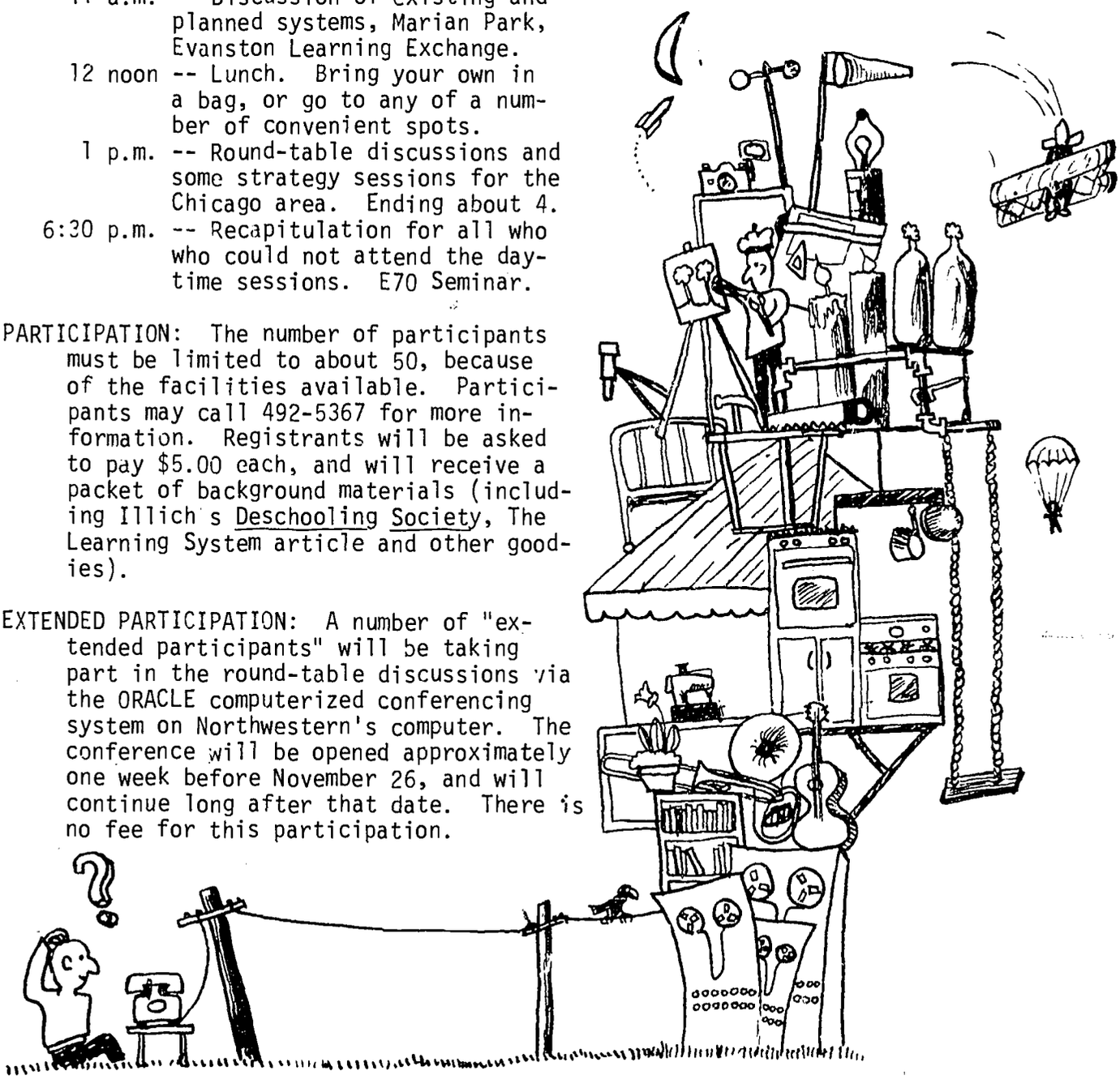
WHAT: This discussion will cover needs and desires -- it will be an attempt to coalesce ideas and plot new strategies. It will bring together several groups now planning such systems for the Chicago area.

WHEN: November 26, 1973

- 9 a.m. -- The Learning System. What we're talking about. Learning exchanges, etc.
- 10 a.m. -- The Computer's capabilities. What it can and cannot do. How it all fits in.
- 11 a.m. -- Discussion of existing and planned systems, Marian Park, Evanston Learning Exchange.
- 12 noon -- Lunch. Bring your own in a bag, or go to any of a number of convenient spots.
- 1 p.m. -- Round-table discussions and some strategy sessions for the Chicago area. Ending about 4.
- 6:30 p.m. -- Recapitulation for all who who could not attend the daytime sessions. E70 Seminar.

PARTICIPATION: The number of participants must be limited to about 50, because of the facilities available. Participants may call 492-5367 for more information. Registrants will be asked to pay $5.00 each, and will receive a packet of background materials (including Illich's Deschooling Society, The Learning System article and other goodies).

EXTENDED PARTICIPATION: A number of "extended participants" will be taking part in the round-table discussions via the ORACLE computerized conferencing system on Northwestern's computer. The conference will be opened approximately one week before November 26, and will continue long after that date. There is no fee for this participation.



From:

CAMPUS
MAIL

To:

CAT

2003 Sheridan Rd
Evanston Il. 60201

Write your comments here and mail it back to us...

Please register me for the Conference on Computer-based Learning/Living and Information Exchanges ☐ check here / enclose a check for $5.00

Please add me to your mailing list for

☐ ideas (general public)

☐ ideas and technical info on HYPERTUTOR

name
address

phone

- -

(Fold here and mail back to us with your comments. The address is on the back.)

FROM: Computers And Teaching
Northwestern University
2003 Sheridan Road
Evanston, IL 60201

TO: