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A COMPUTER ASSISTED ENVIRONMENTAL EDUCATION RESOURCE PROGRAM*

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Introduction

Northeast Iowa is an exceptionally beautiful and unique region. Environmental education in the schools and communities of this area is a vital factor in enabling citizens to take a reasoned approach to the conservation and management of this region. Two observations precipitated the action which resulted in the project described in this paper. The first was that the local resources were vulnerable to being utilized in a potentially harmful manner and secondly, teachers did not seem to be taking full advantage of their local resources in their classroom instruction.

The idea behind the project was an attempt to help facilitate environmental education, as well as conventional education, by pooling and cataloging the local environmental and community resources in order to make it convenient for teachers to utilize them efficiently. The Project Staff felt that the library had done a good job in disseminating sources of reference material and didn't want to duplicate or replace that system. Likewise the Area Media Center had a great reservoir of films and adequate catalogs to disseminate information about them. In contrast, possibilities for field trips and the names of people who could be of educational assistance were largely held in individual file folders (or just in the minds of individual teachers), and it was these resources, particularly as they related to environmental education, upon which the project staff wished to focus attention. The project could also provide a means of dealing with pamphlets and clippings which are not cataloged elsewhere. Besides gaining obvious efficiency and accuracy in the dissemination of pooled information, it was felt that the participation of teachers in constructing a catalog was, in itself, a worthwhile project.

After careful thought, it was decided to let the computer serve as our one and only catalog. The main purpose of this paper is to examine the reasons

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for that decision. The fact that the Eastern Allamakee Community School District is one of the *charter members* of the Northeast Iowa Computer Network, which makes use of the Luther College time-shared computer systems, made this approach a viable option. Since the computers are time shared, one can get an almost instantaneous response to an inquiry in a conversational type interaction with the computer (as opposed to dealing with card input and batch processing).

The Program

The first consideration which favored a computerized delivery system was that descriptions of these resources frequently change; a person moves away or the person whom you call to arrange for tours has a new telephone number. By making a single entry in the computer, all catalogs are instantaneously updated. Likewise, it is feasible to add comments, evaluations, and suggestions to an individual resource description when those suggestions come in, rather than saving them for a new edition of a printed catalog to be published.

A second consideration was that we could publish our catalog as soon as we had gathered two or three resource descriptions since a computer information retrieval system is expandable. There was no reason to even attempt to complete the catalog before promoting its use. Indeed, one of the best features of the computer catalog is that all of those who use it are encouraged to add to it.

Whereas the envisioned use is that of searching, with the same approach as one uses a cross referenced index, to retrieve potentially useful information, the computer permits another dissemination technique. The project staff built in a *hotline* feature which can change weekly, or even more frequently, to *suggest* timely activities. Every user, whenever calling for the program, is inflicted with the *hotline of the day*: "The mushrooms are coming out." or "The winter bird count is this Saturday." or "The new cut in county road XX is exposing some arrowheads."

A fourth consideration favoring the computer delivery is one of dissemination. As soon as the resource descriptions were put into the computer for the 15 Lansing Middle School teachers, the descriptions were accessible at once to all of the more than 1500 teachers of the Northeast Iowa Computer Network.

Finally, the computer version of the catalog permits virtually unlimited cross referencing. One can access the computer catalog by subject area *or* by location *or* by grade level *or* by type *or* by combinations. The current list of

descriptors is shown in Figure 1. Note that in searching, they become delimiters.

RESOURCE TYPE	SPECIFIC SUBJECTS	RESOURCE LEVEL
101 Field Trips	301 Agency Service	401 Elementary
102 Materials	302 Agriculture	402 Intermediate
103 Personnel	303 Anthro. - Arch.	403 Advanced
104 Pods	304 Architecture	404 Professional
105 Computer Activities	305 Area History	
	306 Botany	
	307 Crafts	LOCATION OR RESOURCE
	308 Ecology	
SUBJECT AREAS	309 Engineering	501 E. Allamakee
	310 Geography	502 Rest of N.E. Iowa
201 Arts	311 Geology - Paleon.	503 S. E. Minnesota
202 Career Education	312 Government	504 S. W. Wisconsin
203 Earth Science	313 Homemaker-Consumer	505 Beyond Region
204 Life Science	314 Indians-Folklore	
205 Physical Science	315 Industry-Business	APPLICABILITY
206 Soc. Science/Studies	316 Medical	
207 Language Arts	317 Music	600 Universal
208 Mathematics	318 Navigation	601 E. Allamakee
209 Recreation	319 Pollution	602 Regional
	320 Recreation	603 State
	321 Soil - Land Use	604 National
	322 Statistics	
	323 Visual Arts	
	324 Water	SEASONS
	325 Weather	
	326 Zoology	701 Fall
		702 Winter
		703 Spring
		704 Summer

Figure 1. Environmental Education Search Delimiters

The operation of the system is best seen from the user's standpoint. A seventh grade science teacher, who feels that perhaps the most important activity after a long winter is to find a worthwhile field trip for the first warm spring day, might wish to limit the search to field trips but not restrict the subject area. The dialogue with the computer might be as shown in Figure 2. Note the teacher did not bother delimiting with respect to specific subject area or applicability, but did want to make sure the resources would be appropriate for seventh graders and would be available in the spring. Note further, that upon receiving a list of screened titles, the user may request to have printed as many descriptions as desired, and then has the option of searching further.

GET-*GETRES

RUN

GETRES

HOTLINE! MIGRATORY WATERFOWL AND OTHER SPRING BIRDS ARE ARRIVING DAILY IN THE MISSISSIPPI RIVER FLYWAY. SEE LANSING AREA AND WISCONSIN SIDE ABOVE GENOA.

THIS PROGRAM IS TO RETRIEVE POTENTIAL RESOURCES. IT WILL ASK FOR THE SEARCH DELIMITERS BY CODE.

DO YOU NEED A DICTIONARY OF DELIMITER CODES? NO

INPUT SEARCH CODES. ONE PER LINE. TERMINATE WITH A ZERO.

?1

(FIELD TRIPS)

?2

(EARTH SCIENCE)

?2

(LIFE SCIENCE)

?2

(PHYSICAL SCIENCE)

?4

(INTERMEDIATE)

?5

(E. ALLAMAKEE)

?5

(REST OF N.E. IOWA)

?7

(SPRING)

?0

CAMP WINNEBAGO

CANOEING THE YELLOW RIVER

ALLAMAKEE COUNTY MUSEUM

EFFIGY MOUNDS NATIONAL MONUMENT

SPOOK CAVE

GUIDE TO THE UPPER IOWA RIVER

ICE CAVE

PALISADES PARK

DUNNINGS SPRINGS

PORTER HOUSE MUSEUM

PIKES PEAK STATE PARK

YELLOW RIVER FOREST

WENFORD CHURCH

SOIL CONSERVATION SERVICE

ELKADER STONE BRIDGE

OSBANE CONSERVATION EDUCATION CENTER

EXPLORING A POND OR STREAM COMMUNITY

ROCK IDENTIFICATION LAB

ECHO VALLEY PARK

DUGGON'S CAVE PARK

LUTHER COLLEGE PLANETARIUM

WONDER CAVE

MOE PARK

CARDINAL MARSH CONSERVATION AREA

GOULDSBERG PARK

PULPIT ROCK AREA

LAKE MEYER

SKYLINE QUARRY

THE OLD MILL AND PARK

YOU MAY ASK FOR TEXT ASSOCIATED WITH ANY TITLE. PUT IN 'STOP' FOR A TITLE TO TERMINATE.

TITLE? ICE CAVE

101 203 306 311 400 502 600 700

ONE OF THE FEW ICE CAVES IN THE U.S. ABOVE THE NORTH BANK OF THE UPPER IOWA RIVER WITHIN THE CITY LIMITS OF DECORAH. BRING FLASHLIGHTS. CAVE IS SLIPPERY. SEE KNUDSON REPRINT FROM IOWA ACADEMY OF SCIENCE (LANSING MIDDLE SCHOOL LIBRARY A-203-SS). VISIT DUNNINGS SPRING AND PALISADES PARK ON SAME TRIP. ADEQUATE SPACE FOR SACK LUNCH. NO TOILET FACILITY. ADEQUATE PARKING FOR BUS.

TITLE? STOP

DO YOU WISH TO SEARCH FURTHER? NO

DONE

Figure 2. Photo of Teacher/Computer Dialogue.
(The portion typed by the user is underlined.)

The same teacher, in late August, might wish to leave the type of resource wide open but be more selective with respect to subject area. The dialogue with the computer for such a teacher scheduled to teach a unit on ecology during the year might look like that shown in Figure 3.

```
INPUT CODES TO SEARCH ON.  ONE PER LINE.  TERMINATE WITH A ZERO.

?308
  (ECOLOGY)
?319
  (POLLUTION)
?321
  (SOIL & LAND USE)
?402
  (INTERMEDIATE)
?0
```

Figure 3. Appropriate Search Delimitation to Retrieve All Intermediate Level Resources Related to Ecology

Summary

The system just outlined appears to be versatile, dynamic and efficient from both the user's point of view and from the data base manager's point of view. It is felt that the feasibility of the approach has been more than adequately demonstrated. The project staff is seeking the means to improve the system with four enhancements. (1) To shift the center of focus for the data base from Eastern Allamakee to Area One, with a corresponding addition of resources. (2) To establish an editorial review committee to look at the descriptions for accuracy and appropriateness. (3) To establish a data base manager, who would be responsible for updating the resource descriptions, distribute new descriptions to the review committee and to update the *hotline*. (4) To rewrite the information retrieval program to increase its efficiency.

It is pointed out in passing that since all of the resources are coded and their descriptions may be computer printed upon demand, it would be a fairly routine job to cut out the descriptions from a computer printout, paste them onto edge-notched cards, and notch them using the printed code numbers so that the same search could be done with a manual needle sort. This precludes taking advantage of several features of the computer mode, but it could be done with little effort for those teachers not having immediate access to a computer.

Acknowledgements

The project staff gratefully acknowledges the *Teacher Incentive Award Program* of the Department of Public Instruction which provided support for initiating the project and the major stimulus for keeping the project on the desired time table.

Wanted Names of Outstanding Science Teachers In Iowa

The Board of Directors of the Iowa Academy of Science has approved the recommendation of the Recognition and Awards Committee to expand the Excellence in Science Teaching Awards Program. This action was taken in response to interest from science teachers and school administrators and to vigorous support from the Science Teaching Section of the Academy.

Awards will now recognize the outstanding elementary and junior high science teachers in addition to distinguished secondary science teachers. First awards in these new categories will be made at the 1976 Annual Meeting of the Iowa Academy of Science. If you would like to nominate someone for any of the award categories, send your request for nomination forms to:

Excellence in Science Teaching Awards
Mr. David McCalley
Department of Biology
University of Northern Iowa
Cedar Falls, Iowa 50613

The Bicentennial

The Bicentennial will be celebrated in Iowa classrooms in many ways. By looking back on past scientific achievements, students may be better able to understand and appreciate the present and predict the future. If you are observing the Bicentennial in your science classes, write to Editor, ISTJ, Biology Department, University of Northern Iowa, Cedar Falls, Iowa 50613 and space will be devoted in the journal as to how the Bicentennial is being observed in science classes throughout the state. The journal is also interested in any written memorabilia concerning science teaching in the past.