

TEACHING WITH MARC TAPES

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A computer based laboratory for library science students to use in class assignments and for independent projects has been developed and used for one year at Syracuse University. MARC Pilot Project tapes formed the data base. Different computer programs and various samples of the MARC file (48,000 records, approx.) were used for search and retrieval operations. Data bases, programs, and seven different class assignments are described and evaluated for their impact on library education in general and individual students and faculty in particular.

A computer based laboratory for use in library science instruction, with the MARC Pilot Project tapes as the file of catalog records, has been the focus of LEEP (Library Education Experimental Project) at Syracuse University, School of Library Science, since August 1968. Work has been twofold: 1) development of the laboratory as an instructional tool and 2) exploration of applications of such a facility in library education. The instructional aspect of the project is really "learning with MARC tapes". The development of the laboratory has been reported elsewhere (1), and will not be emphasized in this report.

Many of today's students in library schools will be tomorrow's workers in libraries that will be parts of library networks and cooperative technical processing centers. They will be involved in library automation projects and related developments. In anticipation of personnel needs for new modes of library service, LEEP designed activities in the laboratory to satisfy minimum requirements for tomorrow's professional and to encourage maximum use for students with serious interests.

The aim during the past year has been to develop a laboratory where computer programs and the MARC tapes could be used by library school faculty in class assignments and by students for independent research. The objective was to achieve a program of activities integrated throughout the library school curriculum—one in which computer applications would be seen as one more source of support for the functioning librarian. Students were to be provided with a myriad of experiences that would help them to probe the potential usefulness of machine readable catalog data and to develop certain minimal skills needed for using computer based retrieval systems. Figure 1 shows the resulting place of LEEP in the library school. The approach has two stresses: 1) demonstrations of library automation and 2) activities where computers are used in librarianship for research and experimental applications. This orientation is in contradistinction to Hillis Griffin's use of the term, automation in technical processes, (as he defines it, it includes only acquisition, cataloging, and circulation processes) (2).

After a short description of the facilities at Syracuse this paper will deal with the various class assignments and student projects developed in the first academic year of use, the feedback from students and faculty concerning the usefulness of MARC records in instruction, and the authors' conclusions.

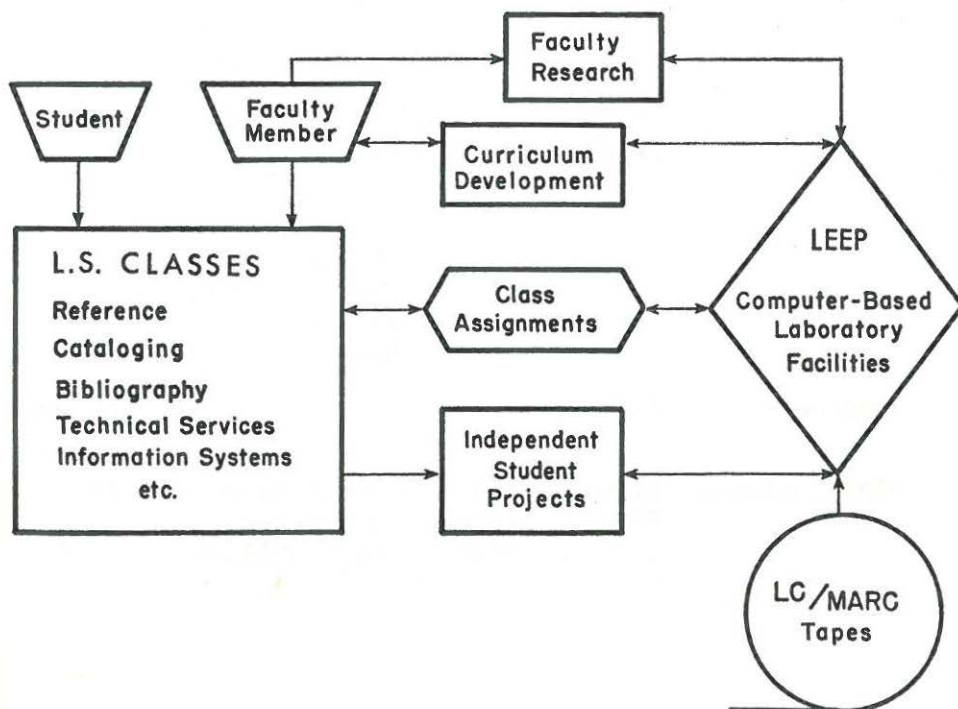


Fig. 1. LEEP's Role in the Library School.

TABLE 1: *Data Bases and Computer Programs Available Through LEEP.*

I. <i>Data Bases:</i>	MARC I — 48,000 records (the entire Pilot Project file)	
<i>LEEP Programs</i>	<i>Function</i>	<i>Program Language</i>
BIBLOLST(3)	Access by LC card number, prints each bibliographic record in LC diagnostic format.	Assembler
FDR(4)	A frequency distribution program for file study.	Assembler
MARC I Double Column Lister	Prints the entire content of a file of MARC I records in a two-column page format.	Assembler
MARC I Record Sort	Sorts a file of MARC I records on the content of any variable (tagged) field.	Assembler
II. <i>Data Bases:</i>	MARC/DPS—1000 (the first 1000 MARC I records)	
	MARCS/DPS—5200 records (a stratified sample of social science records, selected by LC class number, and the LC A's and Z's)	
	MARCS/DPS (II)—5200 records above, plus 3800 (a stratified sample in humanities, selected by LC class number)	
<i>Programs</i>	<i>Function</i>	<i>Program Language</i>
MARC reformat	Reformats MARC I records to meet DPS requirements and performs certain counts of characters per field, etc.	PL/I

DPS
(IBM Document Processing System)
(1,5,6)

Processes entire text of MARC record to produce dictionary and search file, of keywords.
Retrieves records by any keyword or keyword combinations specified by searcher. Allows for root searches, weighting, phrase and field placement, etc.

III. *Data Bases:*

MARCS/MOLDS—5200 (See MARCS/DPS above)
MARCH/MOLDS—3800 (See MARCS/DPS (II) above)

<i>Programs</i>	<i>Function</i>	<i>Program Language</i>
DBG (7)	Data base generator; selects and formats records for MOLDS.	PL/I
MOLDS (Management Online Data System) (8)	Retrieves fixed-field records by matching elements; includes sort capabilities and arithmetic operations.	Fortran

IV. *Data Bases:*

LICOSH (LC Subject Headings, 7th ed.)

<i>Programs</i>	<i>Function</i>	<i>Program Language</i>
SHOP (Subject Heading Output)	Formats and prints subject heading records.	PL/I
STAT	A frequency distribution program for file study.	PL/I

V. *Data Bases:*

LC/Z Class (LC schedule Z)
Index to Z class

<i>Test Programs</i>	<i>Function</i>	<i>Program Language</i>
Z Text Processor	Selects certain lines of text from sample of LC Z-class schedule and transforms lines into KWIC indexable data.	Assembler, FORTRAN

LEEP FACILITIES

The facilities at LEEP include MARC Pilot Project data bases, computer programs, and personnel. Students and faculty were fully informed of the accessibility of the staff of faculty, programmers, and graduate student liaison personnel for consultation and guidance. Further, the facility includes computer time; either the LEEP budget or the Library School's university-supported computer budget covers the time charges for class assignments and student projects. Table 1 lists and describes the LEEP programs (with explanation of acronyms) and data bases that are available at the present time at the University Computing Center for library instruction purposes.

The LEEP facility uses the University's IBM 360/50 computer with the following characteristics:

Main storage: 512 K bytes

Disc storage: 240 M bytes (2314 disc unit)

3 Tape units: 9 channel (800 bpi max)

1 Tape Unit: 7 channel (800 bpi max)

Printer: 1000 lpm (two print trains, std and TN)

Card read/punch: 1000 cpm in 300 cpm out

Work on the implementation of the computer programs available from the Library of Congress and IBM was carried on through most of the first academic year. BIBLST was in use during the Fall term, but the first efficient retrieval system, DPS, became available only during the Spring 1969 term. For this reason, instructional development has been limited to one semester and one summer session. The experiences reported here are based upon those two terms.

MARC II records became available only in late Spring 1969. No effort to utilize these records has been made to date, but future plans do include using such a data base.

Class Assignments and Student Projects Using LEEP

Because most assignments use the DPS retrieval system, learning that system once helps the student in consecutive assignments. LEEP staff arranged tours of the Computing Center for individual students, classes and faculty. Key punching instruction and DPS explanations were distributed with first assignments, or as needed on an individual basis. During the summer there was instituted an all-school LEEP orientation seminar and a LEEP clinic, where a staff member was available for consultation one hour each day in the corridor outside the Library School classrooms. Materials related to MARC/DPS are always available near the students' study carrels and their reserved reading shelf.

Seven different assignments were developed for classroom use by the Library School faculty working with the LEEP staff during the first year. Each assignment reflects the interests of the teacher and the purposes of the unit in which it was introduced. During the spring semester over

100 students had computer based assignments (over 200 searches total); during the summer session, seventy-six students had assignments (over 200 searches). Following are abstracts of the seven assignments:

L.S. 407 *Bibliographic Linking*

Reference Service

Purpose: a) Obtain a listing of titles containing bibliographies from MARC records;

b) Prepare for extension and inter-connection of some of these bibliographic entries and the original titles within the MARC data base.

c) Practice bibliographic evaluation.

Procedure: a) Area of interest was selected by Dewey or L.C. class number (root search, AND, OR options) from MARC file of 1000 records. Records with class number and bibliographic note were retrieved using DPS/MARC system.

b) Bibliographic entries in these titles were examined and MARC I worksheets were made for three English monographs, with added data fields for source of reference.

c) Evaluate the bibliographies in the books examined as reference tools for a scholar.

Title Searches

L.S. 427

Cat. & Class.
(Richmond)

Purpose: Contrast searching for titles to be ordered in BPR and in MARC file, in order to obtain L.C. card number, established entry, and full cataloging record.

Procedure: a) Search for 12 titles in BPR (1966 and 1967).

b) Search in MARC file (1000 records) for 10 (AND searches of title words), and prepare unit cards for any 5.

Searching a Shelf-list

L.S. 427

Cat. & Class.
(Moore)

Purpose: a) Verify an assigned class number with library holdings in that number.

b) Compare the subject headings for one class number.

Procedure: Assign Dewey Class numbers to three titles; search the MARCS/DPS file for the assigned number; compare titles cataloged with titles retrieved by search for consistence and compare subject headings on worksheet provided.

Searching for Acquisitions

L.S. 621

Technical Services
(Gration and
Webster)

Purpose: Extract cataloging records from MARC files (48,000 records) for titles selected from *Choice* or *Library Journal* (1967 issues).

Procedure: Cite L.C. card number for selected titles (at least 10); keypunch numbers; submit with job control deck to dispatcher in Computing Center and obtain printout of full L.C. cataloging via BIBLOLST program.

L.S. 621
Technical Services
(Gration)

Evaluation of Series

Purpose: a) For a given subject, examine catalog records for titles in a series.

b) Determine quantity of material on a subject published in series.

c) Evaluate series notes and series tracing with a view to setting policy for series control.

Procedure: a) Search for subject via DPS/MARC system (5000 social science monographs). (AND, OR, root searches of any descriptors are possible.)

b) Examine printout of 50 titles (or less) for series notes, publishers series, etc.

c) Write procedural statement for handling series.

L.S. 628
Information Systems
(Bottle)

Preparation of Bibliographic Information for Machine Input

Purpose: a) Exercise keypunching.

b) Simulate preparation of bibliographic information for machine input.

Procedure: For one MARC I input worksheet (done in LS407) keypunch six data elements following a fixed format.

L.S. 628
Information Systems
(Bottle)

Use of Boolean Logic for Searching MARC File

Purpose: a) Practice in use of Boolean operators.

b) Practice in use of a reference retrieval system, e.g. DPS/MARCS.

Procedure: Construct 3 searches—1) Do OR search for references found earlier in S.U. Library with both L.C. card number and in BNB; 2) Do AND search for two descriptors possibly in same document, e.g., D.C. class number and L.C. class number, or two English language words that describe a subject; 3) Do OR search looking for same subject as in 2). Compare results and comment on use of modifiers (root search, specification of field, sentence, or paragraph to be searched, etc.)

Aside from the structured approach developed for classroom assignments, students were encouraged to develop independent projects.

One student group developed an index to abstracts of recent articles in the area of technical services. This involved analysis of three aspects of information in journal articles (type of library, function, and technique) as described in abstracts prepared by the class. The project group did the coding, keypunching, sorting, and listing needed to produce the index. Several decisions about abbreviations, format, content, and index order had to be made. LEEP provided keypunching and instructions for implementing the project. This student abstracting service, begun by one group in the Fall of 1968, was updated by another group in the Spring. The index was ready in a second edition for use by summer school students. It may become an ongoing service if there is enough student interest.

Another group of students produced a computer printed bibliography on Negro history for an inner-city school library in Syracuse.

PL/I, or Programming Language ONE, was offered twice as a non-credit, eight-session seminar for librarians and library school students. The teacher, a LEEP consultant, stressed the PL/I vocabulary subset for character manipulation. The students, on completion, could do simple programs to access, count and print MARC I records. One student chose to continue his PL/I experience, and under an independent project, programmed an ordering procedure and reporting forms.

Through term projects or independent research, the student can get academic credit, free computer time, and consultation from faculty and LEEP. During the spring and summer, a general invitation to the students to make DPS searches was offered and a form for search evaluation was developed. During the summer session, such independent searches became more popular as instructors of Subject Reference, Bibliography of the Social Sciences, and Bibliography of the Humanities allowed DPS searching as one technique in term project development. These independent search results became a part of the students' subject bibliographies. Searches run by LEEP were used in two classes as instructional aids: in Advanced Cataloging and Classification as examples of precedents in cataloging practices; and in Bibliography of the Social Sciences as an example of bibliography building for area studies work where information on the catalog card can be retrieved by searching any bibliographic field therein.

During the Fall semester, 1969, students had the option of taking a three-unit research course on search strategy and retrieval evaluation. The basic tool of this course was MARC on DPS, and the objective analysis and evaluation of reference retrieval via a computer based system, as well as evaluation of traditional cataloging in a new retrieval form. Work continues to prepare other computer based assignments in courses in the bibliography of social sciences and humanities, advanced cataloging and subject reference.

FEEDBACK AND FINDINGS

This first year has not yet produced conclusive results about the best direction in which to continue, but the faculty has been encouraged to think that the above-described integrated activities for the student are promising. Different students used the computer based laboratory in varying degrees, the depth of their investigations being their choice. For some students the only experience with LEEP was a class assignment or an orientation lecture on computers and cataloging or computers and reference service. Others met LEEP in class but also made efforts to explore the PL/I seminars, and at the informal coffee hours and orientations showed considerable interest in this field. The first year has been a blending of library automation and other concepts in librarianship which the student could explore through practical experience.

Evaluation forms were distributed through student mailboxes at the close of each semester to get individual feedback. Of ninety responding (about 35% of the Library School population) sixty-four students had used LEEP in classes and seventeen had used it independently. Sixty students "picked up new ideas as a result of LEEP." Twenty-two reported no new ideas. Fifty-eight students would "take a job involving library automation" and fifty-five reported this was not the same response they would have given a year earlier. Some comments included: "the field has an exciting future," "automation is of value to libraries," "we need librarians in the field," and "now I can talk to experts and communicate our needs to them."

The first assignment that the student encounters is the most important one. All the students in the school, not just those who have expressed interest in automation, are required to take three of the four courses with LEEP assignments. Students with a broad range of personal interests must be exposed to the potential of computers for libraries.

The first assignment is designed to overcome students' fears of computers and related equipment. Many are reluctant to keypunch and hesitant about approaching any problem involving equipment. The method is a simple one: starting the student out with a simple assignment with little computerese and one that has a high chance of success. Every instruction is made clear and the steps to follow are stated. The reason for the assignment is spelled out exactly and its relation to everyday librarianship explained. Even though students tend to resist what looks foreign and complicated, they usually respond, upon completion of the first assignment: "that was easy". The assignments described above in Cataloging and in Technical Services best illustrate the simple—and locked-in—nature of a beginning assignment.

In the classroom, MARC/DPS has been presented in terms of the assignment. In order to make the system understandable by the uninitiated, students have at times been given only a portion of its capabilities. This approach works well for locked-in assignments, as in Cataloging. How-

ever, it begins to seem that an in-depth introduction to DPS, with all its capabilities and flexibilities, is a better start for some students. An evaluation of retrieval systems and machine readable cataloging data is one instructional aim which may be best achieved in special seminars.

Experience has also shown that at times the integration of LEEP assignments into the instructional objectives of a course vitiates both elements. The Reference assignment is an example. The final objective of the assignment was evaluation of bibliographies in books (indicated by a bibliography note or MARC I indicator). The first section of the assignment included structuring a subject search in MARC/DPS that illustrated access to bibliography indicators not accessible in the card catalog. The second and third parts dealt with retrieval of the books and evaluation of the bibliographies. The students expressed satisfaction with the citation retrieval, but they experienced frustrations in finding the books cited on the MARC tapes. Finally, the evaluation of the bibliographies suffered from the student frustration, and students came to regard a "LEEP sponsored" assignment as "too complicated." The indications from this one assignment were that instruction in retrieval techniques and potential would be sufficient, and need not be tied directly to a larger problem which may rely on external resources. In other classes an integrated approach was used successfully, whenever the techniques and parts of the assignment were kept simple.

The greatest impact of the PL/I non-credit seminar was not learning how to program, but understanding what is involved in using such precise techniques, and how to specify steps with logic. This helped make the programmer's role more understandable to the librarians and students in the class.

SUMMARY

The stress during the first year of operation has been on implementing the LEEP facility for class use. Now that development of data bases and retrieval programs is somewhat stabilized, it is hoped to move on to more use of this tool for analysis and evaluation. With faculty support, it is planned to continue designing class assignments, increasing the "catalog of tested assignments." The intent is to encourage a serious study of the MARC record, and hence traditional cataloging practices. It should also be possible to do some useful research into the nature of bibliographic description as a tool for reference retrieval.

LEEP will continue through 1969-70, using the MARC tapes (MARC I and soon, MARC II). Emphasis will not be to teach "how to automate a library better" but to learn "what difference does a machine readable catalog make" and "of what use and value is such a record to librarians and library users?" The MARC records will be used to ask questions about how to improve or change acquisitions, cataloging, reference, and other library functions. This is a departure from the use of computer

based facilities to teach library data processing. The LEEP approach seems to have had an impact upon library students who are "straight librarians," and not very interested in library automation.

It may also foster a greater interest in analysis and research in the Library School. For example, with machine readable catalog records it is possible to monitor what has been done in practice before and after the Anglo-American Rules, or the various additions in L.C. subject cataloging and classification. It is possible to check cataloging consistency more easily. Because the MARC tapes include both Library of Congress class numbers and Dewey class numbers, they can be compared as to their usefulness for subject searches, subject spread on a library's shelves, etc. With MARC II tapes, it should be possible to simulate a data base more like a national bibliography, and thus open new fields for efficient survey.

As noted earlier, all the research, whether on retrieval evaluation or on the nature of cataloging, is student based. The Library School's objective is to provide the facility, the impetus, and the guidance which make up the intellectual environment where such investigation can be done.

LEEP is a new part of the library school environment. It can serve to encourage librarians to consider, understand, and even use computers where applicable, in library schools today and in the library field tomorrow.

The future use of computers in libraries will be decided by librarians and not by system programmers or automation technologists. To prepare such librarians there must be a time in their lives for experimentation, research and development. There must be a time when they can objectively question what of the old can blend with the new and what will have to be revised. We hope that LEEP has provided that opportunity to some, if not all, of the students and faculty at Syracuse University School of Library Science.

ACKNOWLEDGMENTS

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This paper is based on a presentation before the Library Education Division at the American Library Association Annual meeting, Atlantic City, New Jersey, June 23, 1969.

PROGRAMS AND DESCRIPTIONS

Microfiches and photocopies of the following LEEP program descriptions and related materials may be obtained from National Auxiliary Publications Service of ASIS as follows: 1) "LEEP Program Description for MARC I File: Distribution of Records" (NAPS 00878); 2) "LEEP Report 69-11: LEEP Program Description: MARC I Double Column Lister" (NAPS 00879); 3) "LEEP Report 69-12: LEEP Program Descrip-

tion: LEEP-BIBLOLST" (NAPS 00880); 4) "LEEP Report 69-13: LEEP Program Description: MARC I Record Sort" (NAPS 00881); 5) "LEEP Report 69-14: LEEP Program Description: Listing Machine-Readable Library of Congress Subject Heading File" (NAPS 00882); 6) "LEEP Report 69-15: The Conversion of the LC Classification Schedules to Machine-Readable Form" (NAPS 00883); 7) "Rome Project Program Description: MOLDS Support Package" (NAPS 00884).

Copies in mimeographed form may also be had by writing to Library Education Experimental Project, School of Library Science, Syracuse University, Syracuse, New York 13210.

REFERENCES

1. Atherton, Pauline; Wyman, John: "Searching MARC Tapes with IBM/Document Processing System." In *Proceedings of the American Society for Information Science*, 6 (Westport, Connecticut, Greenwood Publishing Corporation, 1969), 83-88.
2. Griffin, Hillis: "Automation of Technical Processes in Libraries," In *Annual Review of Information Science and Technology*, Volume 3, Cuadra, Carlos A., ed., (Chicago: Encyclopedia Britannica, 1968), pp. 241-262.
3. Library of Congress, Information Systems Office: *MARC Pilot Project Report, Appendix A* (Washington, D.C., 31 January 1967), p. III, 3, 21.
4. Martel, Frank; Stillwell, John: *MARC Pilot Project File Analysis of Distribution of Records* (Syracuse: LEEP Report 69-1).
5. Tessier, Judith: *Index and Manual for IBM System/360 Document Processing System* (Syracuse: LEEP Report 69-5).
6. Tessier, Judith: *Searching MARC/DPS; a User's Manual* (Syracuse, N.Y.: LEEP Report 69-3).
7. LEEP Report to be published December 1969.
8. Peterson, P. L.; Carnes, R.; Reid, I.; et. al.: *Large Scale Information Processing System, Vol. I. Compiler, Natural Language and Information Processing*, Report RADC-TR-68-401, Volume I (April 1969).