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ABSTRACT

Little research has been done on the topic of computer use in curriculum development and curriculum management. This lack of information inspired a survey endorsed by the Colorado Association for Supervision and Curriculum Development (CASCD). After an initial survey of 106 subjects, including 50 state departments of education, 6 states were identified that presumably had had early exposure to computer use in education. The survey then focused on districts in these states, plus members of the CASCD, graduates at the University of Colorado, and districts cited on returned questionnaires. In most responses from the 81 computer-using districts, the curriculum department was found to be responsible for computer use in curriculum work. The average sum spent on computer use was $20,000 a year. Most respondents employed from one to three full-time and one to five part-time personnel to operate the computers. The software used was developed locally by the district. The questionnaires revealed that computers were used for monitoring student progress, for efficiency, and for speed. Finally, state agencies provided personnel and financial support twice as often as other agencies. The document includes eight tables, a list of selected references, a copy of the survey, and two other appendices. (RG)

# AN EXPLORATORY STUDY OF COMPUTER USE IN CURRICULUM DEVELOPMENT AND CURRICULUM MANAGEMENT

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## THE NATURE AND SCOPE OF THE STUDY

### Introduction

The advent of the information age and its concomitant tool, the computer, have impacted education K-12. Most school systems employ computers in their business offices to deal with the operational aspects of the district. Computer instruction for students at various grade levels and with it computer assisted instruction are common place. What is less salient is the degree of computer use in curriculum service divisions in school systems.

Strategic planning has been incorporated into many areas of school management; the computer facilitates the process. The subject for this study was the degree of use of computers in curriculum development and curriculum management.

## THE BACKGROUND OF THE PROBLEM

Curriculum Service Departments in school systems are responsible for a myriad of curriculum development and curriculum management functions. For purposes of this study the following components were isolated:

1. Curriculum Design
2. Needs Assessment
3. Forecasting
4. Selection of Objectives
5. Generating Test Items
6. Monitoring Student Progress
7. Evaluation
8. Materials Selection
9. Analysis of Scope and Sequence
10. Development of Objectives
11. Grouping Students
12. Reporting Student Progress to Parents

## STATEMENT OF THE PROBLEM

This descriptive study explored the use of computers in curriculum development and curriculum management in public school systems. Answers were sought to the following six questions:

1. Are computers used in curriculum development and curriculum management?

2. To what extent are computers used in curriculum development and curriculum management?

3. What are the specific uses of computers in curriculum development and curriculum management?

4. What computer software is used for curriculum development and curriculum management?

5. What commitment has the district made to computer assisted curriculum development and curriculum management in terms of dollar allocations and personnel?

6. Which agencies have provided personnel, financial, and material support for use of computers in curriculum development and curriculum management?

## RELATED RESEARCH

In recent years, much has been written about computers in general and about curriculum and instruction in particular. With decreases in funds for education schools are looking toward computer technology,

> "as a way of helping them provide programs that are machine related, or facilitated by hardware and software, and which are not as dependent upon personnel or as labor intensive." (Gawronski 1983)

Charlene West (1983) stated:

> "Visibly and invisibly, computers are shaping society. Most of us can't go through a single day without coming into contact with some form of advanced technology--whether buying groceries, ordering a Big Mac, making travel reservations, diagnosing what's wrong with our cars, or searching for a new home to live in.... Today more than half of the jobs in the nation are in the information industry."

Ramon Zamora (1983) added,

> "Today's children progress toward a future where accessing, creating, and manipulating information, products, and services will be essential skills."

Global type statements as those above should lead one to presume that research was and is being conducted in curriculum management and curriculum development. That is a questionable presumption based upon the findings of this study.

The researchers in this current study performed a computer search of the literature using the following identifiers: (1) curriculum development (including conceptualizing, planning, etc.); (2) curriculum design (arrangement for the component parts of a curriculum); (3) computer managed instruction (use of a computer to maintain and analyze data); (4) curriculum forecasting; (5) curriculum assessment; and (6) computer use in curriculum development. A total of 39 titles were generated from the search. Examination of the articles and titles generated revealed even though the identifiers related to computer use in curriculum management--assessment, forecasting, development, etc.,--that a majority of the titles and articles generated by the search related to the use of computers in instruction and in business management.

Using the identifiers listed above, the computer search located 10 items related to computer assisted instruction; four related to teaching via

computer in the military; 10 teaching about computers and teaching various subjects via computer technology (higher education, electronics, nursing education, survey courses in computers, mastery learning, instructional method evaluation, child care, vocational education, reading, and mathematics).

Among the items generated were teaching strategies for use of computers in classroom instruction, developing computer literacy among students, computer managed instruction in allied health, using computers to manage hospital organizational change, developing guidelines for primary nursing care curriculum, developing problem solving skills in a developmental guidance curriculum, computer based instruction, management information systems, etc.

A few studies reviewed, related a bit more closely to curriculum management and development but remained on the periphery of the subject(s) researched in this paper. A study by Lee and others, 1982, described a computer based-computer managed instruction model used in revising and managing the curricula of dietetic internship and physical therapy certificate programs. Lee concluded that this approach to curriculum development was desirable and practical and had potential for serving future developments in allied health education.

In 1983, Parker and others created a computer software program which permitted management, review, and renewal of the secondary school teacher certification curriculum. The program was developed at the University of Texas, Arlington.

A Manchester, England, high school designed curriculum structures via computer using the Nor Data School Scheduling System. They obtained positive results and suggested their computer system and program could provide other schools with a valuable aid in planning and implementing curriculum.

The Wisconsin State Board of Vocational, Technical, and Adult Education developed a handbook for the Wisconsin competency based occupational curriculum data system. The system was described as:

> "A complete support system for curriculum development and management that involves the use of computer-based inventory of available curriculum materials to facilitate the sharing of resources among involved parties."

Sections of the guide include planning and describing a curriculum project, development of program goals, grouping and sequencing of tasks, the writing of performance objectives, and the development of objective-based evaluations. Additionally, a 1983 North Carolina publication, "State Plan for Computer Utilization in North Carolina Public Schools," contained an administrative model which described some possible areas of microcomputer use at both the school system and school building levels.

Based upon the literature review, the researchers concluded that the present study qualifies as an exploratory study. Even though school districts are using computers in curriculum management and development, relatively little has been written about the specific topic and even fewer research studies have been conducted.

## DESIGN OF THE STUDY

This was an exploratory study of the current uses of computers in curriculum development and curriculum management as reported by a selected sample of American school districts. The intent was to identify leaders in this area.

It was decided to survey all 50 state departments of education plus the directors of the accrediting associations in all 50 states. This preliminary survey was done to generate a list of school districts which had been identified as using computers in curriculum development and/or management. Letters were sent to the agencies and people shown in Table 1.

TABLE 1. INITIAL SURVEY SUBJECTS

| Agencies and People | Numbers |
|---|---|
| State Departments of Education | 50 |
| Regional Accreditation Chairpersons | 6 |
| North Central Directors | 19 |
| Southern Association Directors | 11 |
| Northwest Association Directors | 7 |
| Middle States Association Director | 1 |
| Western Association Director | 1 |
| New England Association Director | 1 |
| Selected Education Leaders | 10 |
| Total | 106 |

### Colorado ASCD Endorsement

Upon the request of the research team, the Executive Board of the Colorado Association for Supervision and Curriculum Development endorsed the study, so that cover letters for all mailings were on Colorado ASCD stationery. This Colorado ASCD support enabled the research team to use ASCD lists of members for Colorado, Florida, California, Minnesota, Oregon, and Texas. This helped with the return since a Colorado ASCD endorsed study team was requesting information in many cases from ASCD members in other states. These states were selected for more in depth sampling based upon the belief that they had early and extensive involvement with the use of computers for educational purposes.

### Selected Sample

Approximately 100 school districts were identified through the initial survey as being involved with computer-based curriculum development. A questionnaire was developed to send to these districts (Appendix A). Information was sought with respect to what uses the school districts were making of computers in curriculum development and curriculum management. Two additionally selected groups were surveyed. A group of University of Colorado doctoral

graduates who were in public school management positions across the country were included. Also, selected school districts were cited on the returned questionnaires and were thus added to the sample. Table 2 presents the groups to which the survey was mailed and the number of questionnaires sent to each group.

TABLE 2. GROUPS TO WHICH SURVEYS WERE MAILED

| Groups | Number of Questionnaires |
|---|---|
| School Districts Identified through the Initial Survey | 100 |
| ASCD Members in Selected Samples from California, Florida, Minnesota, Texas, Oregon, and Colorado | 125 |
| Selected Group of University of Colorado Doctoral Graduates | 25 |
| Identified School Districts from Second Mailing | 25 |
| Total | 275 |

## Instrument

Using ten basic questions about the use of computers in curriculum development and curriculum management, the research team developed a questionnaire designed to gain information about the problems and subproblems.

These subquestions were covered in the survey:

1. Is your district using computers in curriculum development and curriculum management?

2. Which office/department is responsible for the use of computers in curriculum development and management?

3. What is the approximate amount of money that your district spends annually for using computers in curriculum development and management?

4. How many full- and/or part-time personnel has your district committed to work with computers in developing and managing curriculum?

5. What computer software are you using for curriculum development and management?

6. To what extent are you using computers in curriculum development and management?

7. How is your district using computers in curriculum development and management?

8. What reasons were behind your district's decision to use computers in curriculum development and management?

9. What agencies have provided you with personnel, financial, or material support for your use of computers in curriculum development and management?

10. What other school districts do you know of which are using computers in curriculum development and management?

Several items concerned with the nature of the school districts were also included to determine if the districts identified as working with computer curriculum development had any specific characteristics. All questionnaires were mailed to the selected school districts with a cover letter on Colorado ASCD stationery and with a stamped, self-addressed return envelope.

## Returns

Questionnaires were sent to school districts in 38 states. California, Colorado, Florida, Minnesota, Massachusetts, Oregon, and Texas all had 20 to 25 school districts surveyed. Table 3 reports on the responses.

TABLE 3. RETURNS OF THE SURVEY

| Categories | Number |
|---|---|
| Total Questionnaires Mailed | 275 |
| Non Deliverable Questionnaires | 3 |
| Usable Returns | 112 |
| Non Usable Returns | 14 |

Using 126 as the total number of returns and 272 as the total number of questionnaires delivered to the school districts, the return rate was 46 percent.

In Table 4, the returns are broken down by state. There were returns from 31 states. As would be expected, the largest number of returns was from those states which received the most survey instruments. There were a few surprises in the data. New Mexico (5), Idaho (6), Maine (5), Mississippi (8), and Missouri (6) had returns as shown in the parentheses. These were not originally identified as states which had active computer programs in education. They were cited by the State Department of Education responders, the accrediting association directors, or by the survey responders; and it was found that some of these states were sponsoring programs which had resulted in greater district use of computers.

TABLE 4. SCHOOL DISTRICTS REPORTING BY STATES

| State | Questionnaires Mailed | Questionnaires Returned |
|---|---|---|
| Arizona | 8 | 2 |
| Arkansas | 1 | 1 |
| California | 22 | 11 |
| Colorado | 21 | 7 |
| Connecticut | 2 | 1 |
| Florida | 19 | 4 |
| Georgia | 2 | 1 |
| Hawaii | 1 | 1 |
| Idaho | 9 | 6 |
| Illinois | 3 | 0 |
| Indiana | 1 | 1 |
| Iowa | 2 | 1 |
| Kansas | 1 | 1 |
| Maine | 5 | 4 |
| Massachusetts | 2 | 1 |
| Michigan | 5 | 1 |
| Minnesota | 22 | 7 |
| Mississippi | 18 | 9 |
| Missouri | 3 | 6* |
| Montana | 1 | 1 |
| Nebraska | 6 | 1 |
| Nevada | 1 | 1 |
| New Hampshire | 2 | 0 |
| New Jersey | 1 | 2* |
| New Mexico | 9 | 5 |
| New York | 5 | 2 |
| North Carolina | 2 | 0 |
| Ohio | 1 | 0 |
| Oklahoma | 3 | 3 |
| Oregon | 23 | 6 |
| Rhode Island | 2 | 1 |
| South Carolina | 6 | 4 |
| South Dakota | 4 | 3 |
| Tennessee | 3 | 2 |
| Texas | 22 | 8 |
| Utah | 3 | 0 |
| Washington | 8 | 4 |
| Wisconsin | 1 | 0 |
| Wyoming | 4 | 5* |
| Sub Total | 258 | 113 |
| Non Deliverable | 3 | |
| Non Usable Returns | 14 | |
| Total | 275 | 113 |

*Returned questionnaires exceed questionnaires mailed to that state. Our explanation is that the original subject had no curriculum computer program and hence sent the survey to someone in another state who had a computer program.

## DATA ANALYSIS

The returned questionnaires were analyzed using the Statistical Package for Social Sciences (SPSS) programs. The programs used produced a frequency distribution for each item of the survey (frequencies) and a Chi-square comparison among the items of the survey (crosstabs). In addition, the open-ended questions were compiled and analyzed by use of frequency and rank order tables. One hundred and ten surveys were analyzed. Eighty-one districts of that number indicated that they were "using computers in curriculum development and management" (Question #1). The remainder of this analysis is focused on the eighty-one returns from districts reporting using computers.

### Demographic Information

The demographic information that came from the data analysis is presented in the following summary statements.

1. Broken down by region, the 81 districts were distributed as follows: West--31, North Central--18, South--23, and Northeast--8 (Appendix B).

2. Seventy-six percent of the districts had fewer than 20,000 students.

3. Seventy-one percent of the districts were located in urban areas, suburbs, or medium-sized cities.

4. Eighty-six percent of the districts were organized in the K-12 structure.

5. The per pupil cost in 79 percent of the districts was between $2,000 and $4,000 per year.

6. Sixty percent of the districts listed the curriculum department as the office responsible for using computers in curriculum development and management (Question #2).

7. The median annual expenditure for using computers in curriculum development and management was $20,000 (Question #3).

8. Seventy-one percent of the districts reported using 1-3 full-time personnel for developing and managing curriculum (Question #4).

9. Seventy-six percent of the districts reported using 1-5 part-time personnel for developing and managing curriculum (Question #4).

10. Seventy-one percent of the districts reported that they were using computers for curriculum development and management on a district-wide basis (Question #6).

An open-ended question (#5) asked respondents: "What computer software are you using for curriculum management and curriculum development?" Respondents

were free to list multiple responses. A total of 162 responses to the question and 71 separate programs were listed. The researchers concluded that not all of the programs are used in curriculum management and curriculum development since many of the software programs listed were related to subject matter areas and student evaluation. Of course, a broad definition of curriculum might extend the software packages to include all named.

Local district developed software packages were named most often by respondents. A total of 27 respondents answered that their packages were locally developed. Mastery Management Software was mentioned second most numerously. Other packages named are listed below. Those mentioned numerous times have their frequency of mention in parenthesis. Those with no numbers were mentioned only once.

TABLE 5. DESCRIPTIONS OF COMPUTER SOFTWARE USED FOR CURRICULUM MANAGEMENT AND CURRICULUM DEVELOPMENT (Frequencies in parentheses)

District Developed (27)
Mastery Management System (17)
(Houghton-Mifflin)
AppleWorks (12)
IBM Packages (8)
Apple Products-MECC (6)
Lotus 123 (6)
MacIntosh/Excel/MacWrite (4)
IMS+ from Scantron (3)
PFS (3)
WICAT System (3)
Word Perfect (3)
WordStar (3)
AppleWriter (3)
DEC Wordprocessing (3)
Curriculum Management Systems (2)
DisplayWrite (2)
J&K's Student System (2)
OSIRIS (2)
TESCOR (2)
Random House--Individualized
Study Master (2)
Addison-Wesley, Management in Math
Bank Street Writer
Burroughs B-25 Software
CAI Blocks
Central Systems Testing Package
Century Consultants L&D
Chadsworth Data Systems
Cinncinnati Instructional Manager
Classroom Answer
Collier Package, Collier Co., Florida
Comprehensive Communications
Reading Program
Comprehensive Test of Basic Skills
Computer Adaptive Testing
Computer Curriculum Corp.
DB Master
ENROLL
EPIE
ESTC
Evans Newton Project Basic
FreeLance
Ginn Management in Reading
Grade Book--Grade Calc
Gulf Ed. System
Harcourt Brace
IMPAC Arkansas State Univ.
Logo
McGraw Hill MIMS Project
MEB, Inc.
Microsystems
Milliken
MS DOS
Multiplan
PageMaker
PAR (Student Assessment)
Prescriptive Learning
Profile III Plus
R Base 5000
Reflex
Scoring by Objectives
South Carolina Governor's
Remediation Program
State Developed Software
SuperCalc
SuperScript
Syntrex (Word Processing)
Terrapin Logo
Tests of Individualized Performance
Systems
The Classroom Answer
The School System
Twin
Waterford Test of Basic Skills

"What reasons were behind your district's decision to use computers in curriculum management and curriculum development?" was question #8 of the survey. The responses to Question #8 are summarized in Table 6. The responses to this question related more to speed and efficiency in handling data than to an intent to use the computer to develop or manage curriculum.

TABLE 6. REASONS FOR USING COMPUTERS IN CURRICULUM DESIGN AND CURRICULUM MANAGEMENT

| Reasons | Frequency | Rank |
|---|---|---|
| Monitor student progress | 23 | 1 |
| Efficiency | 18 | 2 |
| Speed | 15 | 3 |
| State mandate | 8 | 4 |
| Reduce paper work | 7 | 5 |
| Ease of changing and updating information | 6 | 6 |
| Facilitate student learning | 6 | 6 |
| Growing amount of information to manage | 5 | 8 |
| Effectiveness | 4 | 9 |
| Accuracy | 3 | 11 |
| Caused by computer infusion into classrooms | 3 | 11 |
| Outcome based education | 3 | 11 |
| Convenience | 2 | 13 |
| Accountability | 1 | 16 |
| Community expectations | 1 | 16 |
| Cost | 1 | 16 |
| Evolved from mainframe applications | 1 | 16 |
| Monitor teacher productivity | 1 | 16 |
| Record keeping | 1 | 16 |

Question #9 asked repondents to "circle any of the following agencies that have provided personnel, financial/material support for your use of computers in curriculum management and curriculum development." The results of the analysis of Question #9 are summarized in Table 7. It appeared that state agencies were utilized more than twice as often as any of the other agencies listed.

TABLE 7. FREQUENCY OF HELP PROVIDED BY AGENCIES OUTSIDE THE DISTRICT

| Agencies | % of Use | Rank |
|---|---|---|
| State Department of Education | 57 | 1 |
| Federal Agency | 27 | 2 |
| Commercial Agency | 27 | 2 |
| Other | 27 | 2 |
| Regional Education Unit | 24 | 5 |
| University/College | 18 | 6 |

"How is your district using computers in curriculum development and curriculum management?" was question #7 of the questionnaire. The discussion of the results of analyzing the responses to Question #7 have been reserved for last because it represents the main purpose of the survey. Table 8 contains a summary of the responses to Question #7. The first five uses listed in Table 8 reflect rather typical testing and evaluation uses of computers. The types of uses commonly associated with developing and managing curriculum were reported by only 37 percent of the districts in the sample.

TABLE 8. FREQUENCY OF COMPUTER USE FOR CURRICULUM DESIGN AND CURRICULUM MANAGEMENT

| Curriculum Computer Uses | % of Use | Rank |
|---|---|---|
| Monitoring Student Progress | 91 | 1 |
| Evaluation | 72 | 2 |
| Reporting Student Progress to Parents | 72 | 2 |
| Generating Test Items | 57 | 4 |
| Needs Assessment | 49 | 5 |
| Grouping Students | 40 | 6 |
| Selection of Objectives | 37 | 7 |
| Curriculum Design | 33 | 8 |
| Development of Objectives | 27 | 9 |
| Analysis of Scope and Sequence | 24 | 10 |
| Forecasting | 24 | 10 |
| Materials Selection | 19 | 12 |
| Other | 11 | 13 |

## Chi-Square Comparisons

The Chi-square comparisons helped to identify a list of significant relationships. The following list presents the more interesting of these relationships:

1. The smaller districts (under 5,000 students) made up 60 percent of the districts not using computers in curriculum development and management.

2. There was no significant relationship between per pupil expenditures and the amount of money a district spent on using computers in curriculum development and management.

3. Districts in the South and North Central regions reported a much higher frequency of district wide use of computers than districts in the West and Northeast.

Question #7 of the questionnaire asked for other uses of computers in curriculum development and curriculum management. Varied responses were given concerning the question. Twenty-four separate responders listed items. The unedited comments are listed in Appendix C.

Overall, the Chi-square comparisons and the open ended responses (Appendix C) confirmed the observation made when the researchers interpreted the frequency distribution results of Question #7. Many of the districts that reported using the computer to "monitor student progress" also reported using it for other testing program applications such as "evaluation," "generating test items," "reporting student progress to parents," and "grouping students." On the other hand, districts that reported uses like "curriculum design" and "section of objectives" also reported uses such as "development of objectives," "analysis of scope and sequence," and "forecasting." In general, the districts reporting in the study were not very involved in using computers to develop and/or manage curriculum; rather, they were using their computers and software to track students in some form of testing and evaluation program.

## MAJOR FINDINGS

1. Many of the reporting districts have developed their own software to use in the development and management of curriculum. Some districts were using general information management packages which had been adapted for curriculum work such as word processors, data bases, and spread sheets.

2. In the districts reporting, the use of computers in curriculum development and management was based upon speed and efficiency in handling data rather than other computer capabilities.

3. Of the agencies which could provide personnel, financial, and material support to the school districts for using computers for curriculum development and management, state agencies were used more than twice as often as others such as universities, federal agencies, regional educational agencies, or commercial agencies.

4. Uses of computers for curriculum work centered on testing and evaluation activities such as monitoring student progress, evaluation, reporting student progress, and generating test items rather than on such curriculum development activities as material selection, forecasting, analysis of scope and sequence, and development of objectives.

5. This exploratory study determined that the school districts reporting were not using computers to any great degree to design or manage curriculum. The main use of computers and software associated with curriculum work was to track students for testing and evaluation programs.

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APPENDIX A


**Colorado Association for Supervision and Curriculum Development**

November 12, 1986

Dear Colleague:

We are members of a research team of Colorado ASCD members who are conducting a study on the use of computers in curriculum development and management. We are attempting to discover to what degree computers are used for forecasting, assessing student competency, reviewing and organizing the scope and sequence of curriculum content, identifying and selecting academic content and materials, and evaluating curriculum plans and materials.

We are requesting that you complete the accompanying questionnaire. The survey results will serve as the foundation of an attempt to determine the use of computers in curriculum services.

Intense effort has been made to keep the length of the instrument short and yet to provide the needed information. The time spent responding to the items will be greatly appreciated and very important to this study. Upon completion of the questionnaire, please return it in the self-addressed stamped envelope which is provided.

To reiterate, your help will be invaluable to this study and meaningful to the educational community. Thank you for your time.

Sincerely,

Dennis W. Cole
Dr. Dennis W. Cole
Colorado State University

Myrle E. Hemenway
Dr. Myrle E. Hemenway, Professor Emeritus
University of Colorado at Boulder

Gary L. Hillman
Dr. Gary L. Hillman
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Bob L. Taylor
Dr. Bob L. Taylor
University of Colorado at Denver

SURVEY

Computer Management/Development of Curriculum

_____

School District

_____

Address City State Zip

Size of District (Please Circle One):

Less Than 5,000 Students
5,000 - 19,999 Students
20,000 - 40,000 Students
More Than 40,000 Students

District Type (Please Circle One):

Urban Suburban Medium City Small Town Rural

District Structure (Please Circle One):

K - 8 9 - 12 K - 12 Other_____

Per Pupil Expenditures, 1985-86 (Please Circle One):

Less Than $2,000/pupil
$2,000/pupil - $2,999/pupil
$2,999/pupil - $4,000/pupil
More Than $4,000/pupil

1. IS YOUR DISTRICT USING COMPUTERS IN CURRICULUM MANAGEMENT AND CURRICULUM DEVELOPMENT? (Please Circle One):

YES NO

A. If you answered YES, please respond to questions #2 - #8 below.

B. If you answered NO, please respond to question #8 below.

2. Which office/department is responsible for the use of computers in curriculum development and curriculum management? (Please Circle One):

Curriculum
Computer Services
Personnel
Other (Please Specify):

_____

3. Please specify the approximate amount of money that your district spends annually for using computers in curriculum development or curriculum management. $_____

4. Please indicate the number of full and/or part-time personnel your district has committed to work with computers in developing or managing curriculum. full time_____

part time_____

5. What computer software are you using for curriculum management and curriculum development?

_____

_____

_____

6. To what extent are you using computers in curriculum development and curriculum management? (Please Circle One):

District-Wide

Most Schools

Some Schools

7. How is your district using computers in curriculum development and curriculum management? (Circle Any That Apply):

| | |
|---|---|
| Curriculum Design | Evaluation |
| Needs Assessment | Materials Selection |
| Forecasting | Analysis of Scope and Sequence |
| Selection of Objectives | Development of Objectives |
| Generating Test Items | Grouping Students |
| Monitoring Student Progress | Reporting Student Progress to Parents |

Other (Please Specify):

_____

_____

_____

_____

8. What reasons were behind your district's decision to use computers in curriculum management and curriculum development?

_____

_____

_____

_____

9. Please circle any of the following agencies that have provided personnel, financial/material support for your use of computers in curriculum management and curriculum development:

State Education Department

University/College (Please Specify):

_____

A Federal Agency (Please Specify):

_____

Regional Educational Unit

Commercial Agency (Please Specify):

_____

Other (Please Specify):

_____

10. Please list the names and location of other school districts you know of that are using computers in curriculum management and curriculum development.

_____

_____

_____

_____

_____

THANK YOU !!!

## APPENDIX B

Geographical Regions Used by the
U.S. Bureau of the Census
(* denotes states represented in this study)

### WEST

Montana*
Idaho*
Wyoming*
Colorado*
New Mexico*
Arizona*
Utah
Nevada
Washington*
Oregon*
California*
Alaska
Hawaii*

### NORTHEAST

Maine*
New Hampshire
Vermont
Massachusetts*
Rhode Island*
Connecticut*
New York*
New Jersey*
Pennsylvania

### NORTH CENTRAL

Ohio
Indiana
Illinois
Michigan*
Wisconsin*
Minnesota*
Iowa*
Missouri*
North Dakota
South Dakota*
Nebraska*
Kansas*

### SOUTH

Delaware
Maryland
District of Columbia
Virginia
West Virginia
North Carolina
South Carolina*
Georgia*
Florida*
Kentucky
Tennessee*
Alabama
Mississippi*
Arkansas*
Louisana
Oklahoma*
Texas*

## APPENDIX C

### Responses to Open Ended Question #7

1. We generate grade level expectancy scores. By using SAT scores and Otis-Lennon scores, we secure a student grade level expectancy score in each subject at each grade level.

2. Computers allow us to display or print out performance objectives at any specified grade level in any subject area. These performance objectives are continually rewritten and updated by district personnel.

3. We assess achievement of student learning objectives and analyze and plan from the resulting data.

4. Professional growth plans.

5. If it can be done on a computer, we try it.

6. Moving students rationally through the curricula.

7. Scoring.

8. Communications with teachers (we use a fourteen member curriculum council), (K-12) approach with agendas, minutes, and lots of communications to all appropriate staff.

9. Curriculum alignment (mapping).

10. Student placement.

11. Research.

12. Conflict matrix.

13. Schedule some students.

14. We have just begun putting our revised language arts scope and sequence into machine readable format (WPS Plus) on the way to having it available via videotex.

15. Word processing.

16. To write materials relating teaching units to SELOS, to lesson plans, and to computer lab activities.

17. Analysis of Michigan MEAP State Test Results.

18. Analysis of Michigan ACT and SAT results.

19. Inventories and ordering of materials, equipment, and textbooks.
20. Computer application courses.
21. In-house test scoring of criterion referenced tests.
22. Within two years, we'll do our own norm test (ITBS) scoring.
23. Self-paced program for unmotivated students (grades 7-9).
24. Instructing students.
25. Grade level expectancy scores.
26. Grade reporting.
27. Home notices.
28. Class size studies.
29. Test scoring (scanning).