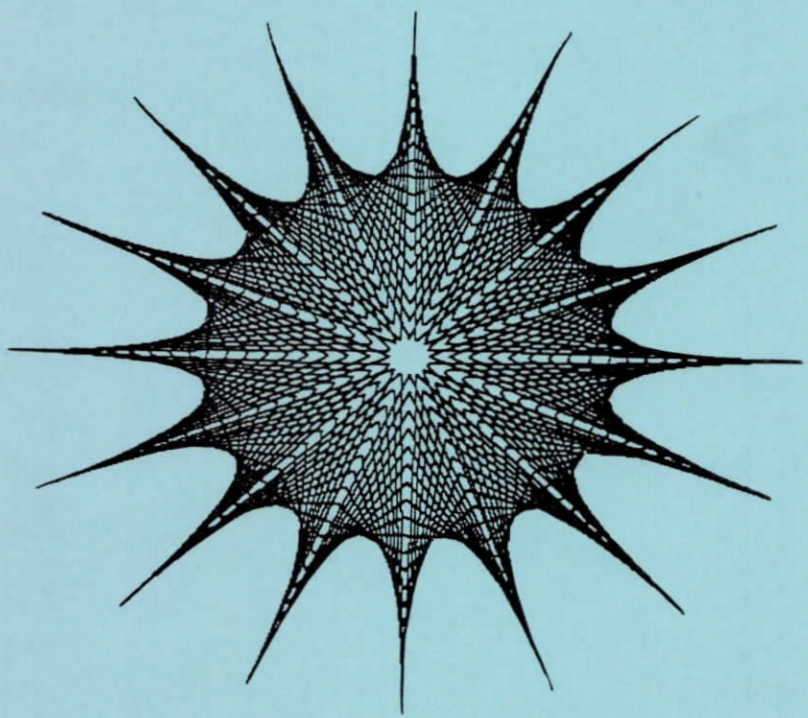
THE SCHOOL COMPUTER COORDINATOR

Microcomputer Inservice Training Guides

Level 3



Edited by

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THE SCHOOL DISTRICT COMPUTER LEADER

Microcomputer Inservice Training Guides, Level 3

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Prepared under a grant from the
Arkansas Department of Higher Education,
1984 - 1985

Instructional Resources Program
College of Education, University of Arkansas
1986

Copies are available from Project IMPAC, State Department of Education, Little Rock, Arkansas 72201.

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FORWARD

Applications of microcomputer technology in enhancing elementary school basic skills instructional programs are being implemented in many school districts throughout the United States. The use of computer assisted and computer managed instruction on stand alone systems or networks of microcomputers can be justified as both cost and educationally effective. In addition, applications such as word processing, grade book programs, databases, and authoring systems are making teachers more efficient.

As persons involved in teacher education, we are being called upon to help give direction to this new technology. Toward this end, and with encouragement from the Instructional Microcomputer Project for Arkansas Classrooms (IMPAC), the Instructional Resources Program of the College of Education at the University of Arkansas prepared and received a grant from the Arkansas Department of Higher Education. This grant provided funds from the writing of three undergraduate or graduate course guides relating to the applications of microcomputers in the public schools. These course guides relate to three groups of educators:

1. Teachers that are using the microcomputer as an instructional tool.
2. Instructional leaders that have a responsibility for computers at the building level.
3. Persons who might wish complete advanced work to be qualified to help a school district implement technology related programs.

The underlying philosophy of the course guides is that all educational technology including microcomputers is important in

providing quality education. These technologies, used wisely, can help the state of Arkansas achieve its new educational standards.

We encourage inservice leaders, college and university professors to use these course outlines as a guide, and provide input back to the editor and to Project IMPAC personnel on their effectiveness and to suggest areas for improvement.

Cecil McDermott,

Project IMPAC

Introduction

The Level III course guide is designed to describe four major areas of computer education that a district computer leader should master. This person might be a district library media supervisor, a member of the district library media program staff, or another person designated by the superintendent and the board of education.

Level I and Level II booklets in this series were designed to be teaching outlines for inservicing teachers and building-level computer coordinators. This booklet is different in its intent, i.e., it suggests areas of education rather than prescribes them. The original committee for these booklets recommended that Level III contain suggested course outlines for a variety of possible advanced work that would be to the advantage of a district level computer leader.

The need for a person at the district level to lead, coordinate and evaluate the use of computers in a school district is evident as the research in Arkansas has shown. Many districts lack any sort of coordinated plan for this technology and depend on individual teachers or building level computer coordinators to produce some sort of program using computers. The product of such an approach is uneven, mediocre, uncoordinated, and substandard. Computers, just one of the educational technologies, do not automatically make a difference in a school or district just because the equipment is in place. An assumption to that effect is dangerous and misleads parents who have higher expectations when they know that high technology is available in their local school.

Course #1

ADMINISTERING EDUCATIONAL COMPUTER PROGRAMS

Course Goals: Students should be able to explore a wide variety of issues which will confront district educators as they institute or make major changes in their educational computer programs. Knowledge of these issues should be transformed into documents which would be useful for administrators and school boards in defining the role that microcomputers will perform in a particular school district. Students should have the skill to present a district plan to a group (board, administrators, parent's group) in an interesting, succinct, and convincing way as plans are formulated and put in place. The plans created should be practical and take into account the opportunities and constraints provided in an actual district--not in some imaginary utopia.

I. Planning a district computer program

A. Organizing a needs assessment

1. Formulate a research plan
2. Develop a needs survey instrument to include administrators, school boards, faculty, students, and parents
3. Conduct the research
4. Analyze the data
5. Draw conclusions

B. Forming the district computer planning committee

1. Formulate the committee with appropriate representation
2. Consider the needs assessment research
3. Determine the district computer goals and objectives
4. Survey district resources to include financial sources, trained personnel, space, equipment/software/furnishings

C. Creating the district computer education plan

1. Establish the policies
2. Write the plan
3. Propose funding sources
4. Suggest the timeline for implementation

D. Obtaining official approval of the plan

1. Present the plan to the administration
2. Present the plan to the school board
3. Revise the plan as appropriate

II. Establishing computer supported programs

A. Organizational issues

1. Line/staff responsibilities of the computer coordinator(s)
2. Scope of service or program(s) for each building

    a. Grade ranges to be served
    b. Curriculum areas to be served
    c. Location of computers (classrooms, laboratories, combinations of both)
    d. Programs for special users (gifted and talented, remediation, learning disabled)

B. Fiscal issues

1. Type of funding

    a. Hard funds (appropriated)
    b. Soft funds (grants)

2. Spending restrictions/limitations

    a. Purchasing policies
    b. Budgeting cycles
    c. Contractual arrangements

C. Staffing issues

1. Professional staff needed at the district level and at the building level
2. Instructional aides
3. Student/parent volunteers
4. Job descriptions

D. Equipment issues

1. Selection of equipment
2. Bidding/purchase of equipment
3. Inventory assets
4. Maintenance arrangements
5. Installation and connection of units
6. Burn-in and acceptance of system
7. Routine and preventative maintenance
8. Repair and spare parts
9. Replacement and upgrading
10. Compatibility of hardware
11. Standardization of equipment
12. Implementation of changing technology
13. Security and loss prevention
14. Surge protection and power considerations
15. Environmental control (air and humidity)

E. Software issues

1. Software selection

    a. Quality
    b. Quantity

2. Software control

    a. Cataloging
    b. Check in/out procedures
    c. Damage prevention

3. Software evaluation

    a. Recommendations from colleagues in education
    b. Review of software on approval
    c. "Professional" external evaluations (published reviews, recommended lists)
    d. User evaluation

4. Software enhancement

F. Legal issues

1. Copyright/duplication restriction
2. Licensing arrangement with producers

III. A. Service role

1. Serve as a computer consultant
2. Coordinate educational computer programming courses throughout district
3. Coordinate budget development, equipment or software acquisition, installation and usage, and repair services
4. Recommend resources allocation priorities

B. Training function

1. Plan and coordinate educational computing inservice programs for local schools
2. Supervise and/or conduct the inservice training for school educational computing specialists

C. Liaison Role

1. Serve as liaison with institutions of higher education on computing matters
2. Inform district leadership and community of educational computing activities

D. Resource function

1. Resource specialists on technological innovation and research findings
2. Inform district of new developments and future trends
3. Serve as information broker and refereal agent

E. Change agent role

1. Stimulate experimentation with educational computing
2. Raise awareness
3. Encourage risk-taking
4. Build a reward system that recognizes effort and achievement in educational computing

IV. Evaluating the program

A. Collect effectiveness data including how well organization responds and computer's impact on student achievement
B. Review problems and challenges
C. Modify a program as needed in response to evaluation concerns

V. Managing for the future

A. Team building within the district
B. Networking within a region or state
C. Consortia among states
D. Vendor contracts in concert with other agencies
E. Licensing agreements for software arranged cooperatively at the regional or state levels

Suggested Course Activities

1. Have students create a needs assessment research plan including instruments to use, data analysis plan, sample data analysis, and conclusions.

2. Have students write a district plan for their own district in consultation with professionals in their district.

3. Hold a mock school board meeting where the computer coordinator presents the district computing plan.

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6. Preparing for Computer Use. South Carolina Department of Education, 1984.

A state guide designed to incorporate computers into the educational system and map out the curriculum specifications to that effect.

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A planning guide for computer programs in Elementary and Secondary Schools for New Mexico.

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Identifies microcomputer resources available in the public schools and institutions of higher education in Arkansas, the utilization of microcomputers in these educational settings, telecommunication networks currently utilized, and training needs in enhancing educational programs and activities in the State.

Course #2

EDUCATIONAL COMPUTER APPLICATIONS

Course goal: Creating a Level III applications course assumes that the skills outlined for Levels I and II have been mastered. A district computing leader must have a wealth of experience with the available educational software and its application as an instructional and management tool. A broad repertoire of programs, how they can be used, how to apply them to curriculum, how to run and troubleshoot software--all are essential for successful leadership practices. Leadership qualities of modeling sound educational practices, being able to inspire others, and being practical yet visionary are desirable for success. Being able to demonstrate not only how computers can contribute to education but that they actually are contributing because of a district-wide effort is a major goal to be achieved.

I. Competencies for all educational applications.
The district computer leader should be able to:

- A. Match software packages to locally available hardware in terms of peripherals, memory, interface cards, and printers needed.
- B. Cope with differing versions of software running on various machines and disk operating systems.
- C. Troubleshoot operational problems with software of all types.
- D. Know how and where to find information to assist in the location of, the troubleshooting of, and the evaluation of software.
- E. Deal with memory requirements of various types of software on the types of computers available locally.
- F. Have the patience necessary to deal with people/software clashes.
- G. Envision creative uses and imaginary applications for software of all types to solve local problems and educate young people.

II. Word processing

- A. As a teaching tool
  1. Integrating word processing into content areas.
  2. Planning for keyboarding instruction starting at the Kindergarten level.
- B. As a management tool
  1. Knowing how to use similar features across various word processing programs
  2. Exploiting the power of the word processor

3. Creating complicated layout designs such as extra wide documents and multiple column layouts
4. Knowing how to use sophisticated editing, cut and paste capabilities
5. Using page publishing programs in conjunction with word processors to construct official documents, newsletters and other printed materials at commercial quality
6. Creating templates for district and school use
7. Using sophisticated add-ons for word processors such as spelling checkers, grammar checkers, clip art and graphic extenders

III. Database managers

A. As a teaching tool

1. Modeling uses of databases in curricular areas
2. Having students assist in database creation, searching and data evaluation
3. Demonstrating the usefulness of in-house vs. online remote database searching
4. Integrating database searching with other instructional activities (knowing when, why and how to utilize this technique)

B. As a management tool

1. Knowing how to create sophisticated database templates
2. Demonstrating sophisticated database searching skills using Boolean search techniques
3. Producing multiple format printouts

IV. Spreadsheets

A. As a teaching tool

1. Teaching students data analysis in various curricular areas
2. Merging spreadsheet data with graphics programs

B. As a management tool

1. Constructing sophisticated formulas for more complex data analysis
2. Using spreadsheets for many applications beyond budgeting
3. Creating useful layouts
4. Copying information to and from various locations on larger spreadsheets
5. Manipulating blocks of cells
6. Printing out blocks of information, whole spreadsheets both horizontally and vertically

V. Educational software

A. Build software repertoire
B. Constant reading of current periodicals which cover educational computing
C. Knowing reference and review sources for software
D. Knowledge of publishers, MECC, jobbers and evaluation agencies
E. Hardware considerations

1. Re-writing documentation as necessary
2. Matching hardware and peripherals with software
3. Being aware of DOS and version problems
4. Knowing how to configure software to meet system requirements
5. Making legal backups, use of originals and other protection techniques for software

F. Instructional concerns

1. Modeling how software can be integrated into instruction
2. Being able to demonstrate instant utilization of software
3. Pushing packages beyond what the original creators intended
4. Using packages creatively to achieve educational goals
5. Judging cost in relation to payoff for instruction

VI. Graphics utilization as an educational tool

A. Model the possibilities of computer graphics for the non-art person
B. Hardware and peripheral usage

1. Understanding memory, hires, lores and pages for graphic storage and manipulation
2. Understanding how to configure various graphic packages to hardware systems
3. Printing hires and lores graphics in hardcopy both in black and white and color
4. Being able to use graphics peripherals such as graphics tablets, joysticks, mouse, light pen and keyboard
5. Coping with DOS problems
6. Working with various types of printers, i.e., dot matrix, ink jet and laser
7. Manipulating images on storage media (scrunching, capturing and transporting to other programs)
8. Being able to print hard copies of any graphic image

VII. Utility packages

A. Single purpose programs vs. creating home-grown versions with generic packages such as word processors, database managers or spreadsheets
B. Know faculty needs so that commercial utilities can be introduced to best advantage
C. Awareness of program structure and techniques to handle lost files and other problems encountered with commercial packages

Suggested Course Activities

1. Have students troubleshoot malfunctions of software and equipment.

2. Students should be able to demonstrate the manipulation of graphic images both in and out of various graphic packages.

3. Students should demonstrate proficiency at modeling instructional and management packages.

4. Given vocalized needs for management applications, students should be able to prepare sophisticated templates and management systems using word processors, database managers and spreadsheets.

5. Working as teams, students should be able to design computerized solutions to complicated problems.

6. Students should be able to prepare opinion and position papers for administrators, boards and parent groups.

7. Students should prepare all assignments for this course using the computer (no typewriters allowed).

8. Students should demonstrate proficiency at coversion of programs to and from DOS to ProDOS, DIF files, ASCII II files.

9. Have students demonstrate the use of commercial utilities to restructure or fix files.

10. Have students prepare one-sheet documentation on a package they are not familiar with.

11. Students should design graphics for use in their school (organizational logos, letterheads, signage, labeling)

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Course #3

INSTRUCTIONAL DESIGN AND PRODUCT DEVELOPMENT

Course objective: The student should be able to work with educators in any subject discipline to design computerized instruction which will be an effective learning experience. While courses in instructional design and development are common in many institutions of higher education, the focus for the computer leader should be how to incorporate sound principles of instructional design into the production of computerized learning materials.

I. Introduction to basic instructional design principles

   A. Instructional design defined
   B. Instructional design models

II. Problem assessment

   A. What needs to be taught?
   B. What media for local production are available?
   C. What are the advantages and disadvantages of each media?
   D. Which media is the most productive in terms of production time, expense, and potential impact on the learner?

III. Learner's background and attitudes

   A. Prior experience and education
   B. Learning styles
   C. Motivation to learn the subject
   D. Attitude toward:

      1. Course
      2. Teacher
      3. Media selected

IV. Instructional design considerations of the proposed product

   A. Does the software already exist? If so, stop.
   B. Composition of the production team including teachers, designers, programmer, library media specialists or outside consultants
   C. Content to be covered
   D. Length of unit (timeline for student completion)
   E. Design timeline for the production team
   F. Level of task complexity
   G. Level of difficulty that the material should take
   H. Self-paced versus forced-paced considerations
   I. Passive or active learning considerations
   J. Internal sequencing of ideas and activities
   K. Pre/post testing plans
   L. Type of feedback/rewards

V. When to select computers as the appropriate medium of instruction

A. Characteristics of computers which lend themselves to superior instructional potentials
B. Potential for success considering local facilities, equipment, skills of teachers.

VI. Pre-production activities

A. Assemblying resources and equipment
B. Setting production schedules

VII. Production activities

A. Outlining presentation (storyboarding)
B. Breaking the program into modules
C. Creating and testing of each module
D. Hooking modules together and testing.
G. Field testing

1. Peers
2. Students

H. Revising the production
I. Producing documentation manual

VIII. Post-production activities

A. Marketing/distribution plans
B. Software maintenance and updating plans

1. Up-grades? When?
2. Adaptations for special learners, other computers?

Suggested Course Activities

1. Have students design a computerized instructional product with a team of educators which combines sound principles of instructional design and the potential of computerized instruction.

2. Have students design and incorporate not only the computerized sequence in an educational lesson, but also all other forms of media which would be essential given the objectives of a lesson.

3. Students should demonstrate the human relations skills necessary for cooperative design of media with teachers, programmers, library media specialists, and other consultants.

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Course #4

COMPUTER PROGRAMMING FOR EDUCATORS

Introduction: Computer coordinators who are directing computer science curriculum in their districts will need a solid educational background in computer science. Undergraduate coursework in BASIC, Pascal, FORTRAN and other computer languages is offered at most colleges and universities.

Much of that coursework deals with business, engineering, mathematical or engineering applications. Those needing advanced work in programming educational software are usually not well served.

A survey of institutions both in and out of state may locate specific professors who teach courses in:

1. Advanced educational program creation.
2. Interactive computer programs using microcomputers and videodiscs or CD Rom disks.
3. Advanced educational graphics design.
4. The use of robotics in education.
5. Telecommunications design for education.
6. Artificial intelligence and its uses in education.
7. Various DOS systems in micromputers designed for use in education.
8. Use of hard disks and local area networks.

Suggested Course Activities

1. Students should create a marketable educational computer product.

3. Have students create and integrate sophisticated computer graphics an animated sequences into education computer programs.

4. Students could create interactive sequences for the computer utilizing videodisc technology and other audiovisual technology.

5. Have students design a telecommunications system for a school district which would enable students to probe bulletin boards, electronic mail, and information utilities.

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