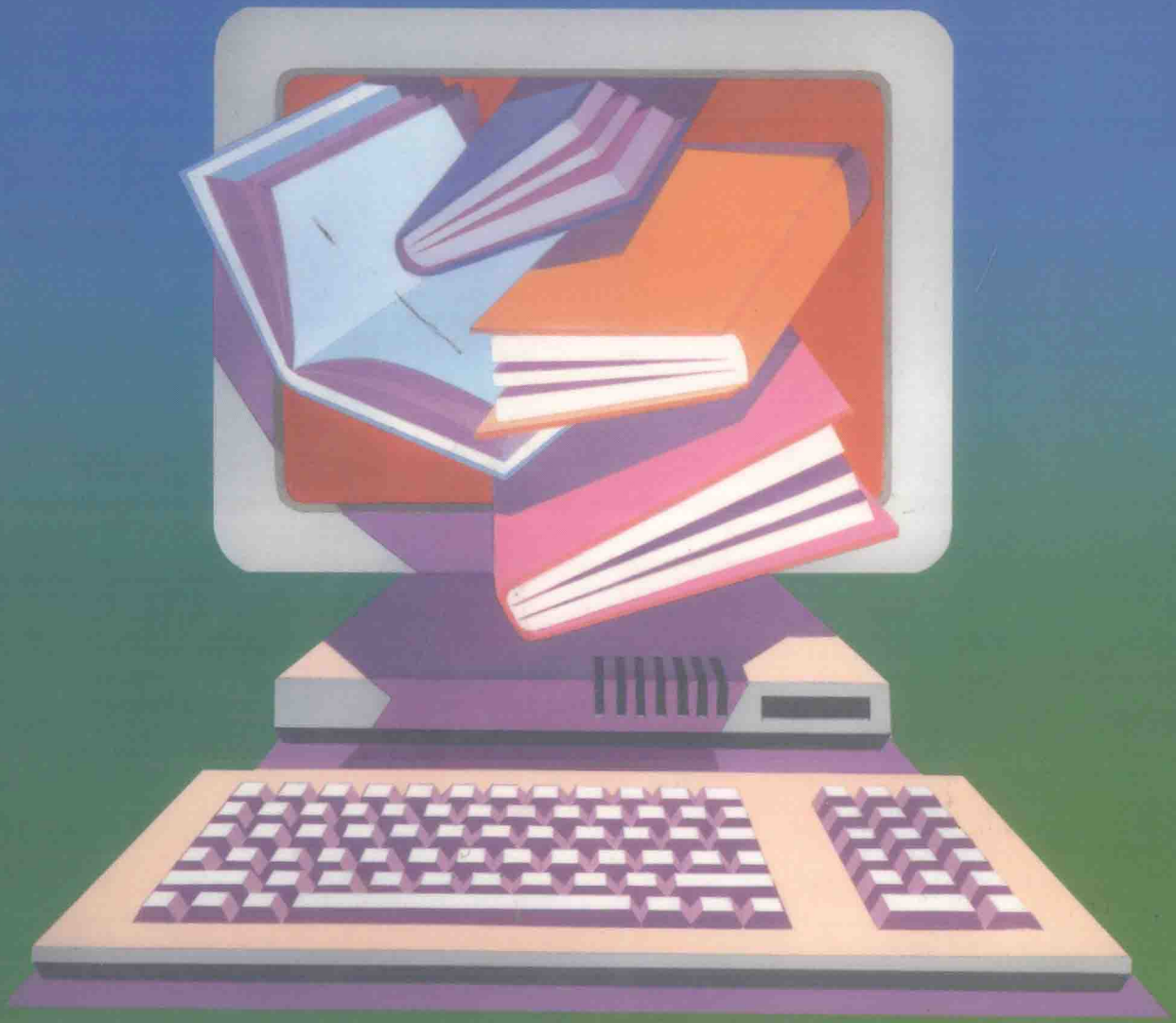
MICROCOMPUTERS IN EDUCATION TODAY

GARY G. BITTER



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PREFACE

Microcomputers in Education Today was written for the preservice or inservice educator who wants to become "computer literate." The book introduces microcomputers and emphasizes productivity tools and the use of computers in learning and the curriculum, today as well as in the future. It assumes no prerequisite computer skills but presents the microcomputer as an effective tool for instruction, focusing on the integration of the microcomputer into the curriculum. A comprehensive coverage of application software, including databases, word processing, spreadsheets, graphics, telecommunications, and integrated software, is included. Suggested roles of the computer for various curriculum areas are outlined. Computer-assisted and computer-managed instruction are discussed, including references for popular educational software. The book uses an education orientation throughout, and thus serves as a valuable aid for the preservice or inservice teacher in preparing to use the microcomputer in the classroom.

ORGANIZATION

Chapter 1 focuses on applications of the microcomputer in education. It discusses why computers are so popular and why they can be invaluable as learning tools. Computer-assisted and computer-managed instruction are explored and their advantages and disadvantages discussed.

Chapter 2 outlines the history of computers in education. The computer "family tree" is discussed, including the standard "generations." Early educational computing activities are explored, and their significance to current practices is explained.

Chapter 3 describes the components of a computer system. Numerous photos and illustrations explain the parts of a computer and its peripheral devices. The concept of software as the necessary instructions that run a computer is introduced. Programming, including techniques to plan programs, is outlined. The chapter concludes with the types of software required to operate a microcomputer system.

Chapter 4 concentrates on integrating the computer into the curriculum. Proper care of hardware, steps in writing a lesson plan (including computer uses), discussion of types of software, and software programs for the various curriculum areas are all discussed. The chapter concludes with a description of tool software.

Chapter 5 carefully details the specifics of common word processing terms and capabilities, as well as factors to consider in choosing a word processor, and concludes with a discussion of several commercial educational word processing programs.

Chapter 6 defines and provides a brief history of spreadsheets. Educational applications, as well as a listing of several educational software packages, are included. Terms and capabilities of common spreadsheet packages are discussed.

Chapter 7 provides a definition of "databases," including terms and capabilities. Commercial educational databases are introduced. The chapter carefully describes how to create a database and enter data.

Chapter 8 outlines graphics capabilities and explains how graphics are used in education. Several popular educational graphics programs are listed, outlined, and illustrated.

Chapter 9 examines the role of telecommunications in education. The requirements for telecommunications, including terms, equipment, and networking are discussed. The advantages of integrated software packages are reviewed. The chapter's conclusion investigates desktop publishing, including educational implications.

Chapter 10 examines the benefits of computer-assisted instruction (CAI) in education, with the characteristics of effective CAI software provided. The advantages and disadvantages of drill-and-practice, tutorial, simulation, and problem-solving software are covered.

Chapter 11 discusses the characteristics, advantages, and disadvantages of computer-managed instruction (CMI). The electronic gradebook is described; test generation is reviewed; and networked CMI is introduced. CMI examples are produced to illustrate their role in education. How to choose and implement CMI programs concludes this chapter.

Chapter 12 includes sources of software information. User groups and public domain software are discussed. The chapter concentrates on techniques and procedures for reviewing educational software, including what makes CAI software effective.

Chapter 13 examines social and ethical concerns such as software piracy, computer fraud, and privacy. All topics are related to education.

Chapter 14 explores technology of the future such as optical disks, video

disks, CD-ROM, telecommunications, digital video interactive software, HyperCard, robotics, artificial intelligence, and expert systems.

Each chapter concludes with a bibliography, review exercises (including multiple choice, true-false, and short-answer questions), and five to ten educational activities.

SUPPORT TEXT

Appleworks in the Classroom Today (Mitchell Publishing, 1989) is a step-by-step tutorial with educational applications, which was designed to be an accompanying support text to *Microcomputers in Education Today.* It provides hands-on use of the applications of word processing, databases, and spreadsheets. The two texts together can be coordinated with related supporting assignments. The assignments depend on course length and on the rigor desired. Ideally, these two books match the teacher certification requirements of many states and were specifically designed to meet this need.

ACKNOWLEDGMENTS

I would like to thank Roger Howell for encouraging me to write this book. His professional approach to publishing will not be forgotten. My special thanks to Linda Evans for her efforts in this project. Without her expertise, dedication, and patience, this project would never have been completed. Thanks also to Diane Doyle and Gladys Bennett for proofing the manuscript pages, and special thanks to my wife and sons, who have been patient with me during the writing process. Their encouragement of my efforts is appreciated.

It is my hope that the enlightened application of technology in the teaching and learning process will help improve our educational system.

Gary G. Bitter
February 2, 1989

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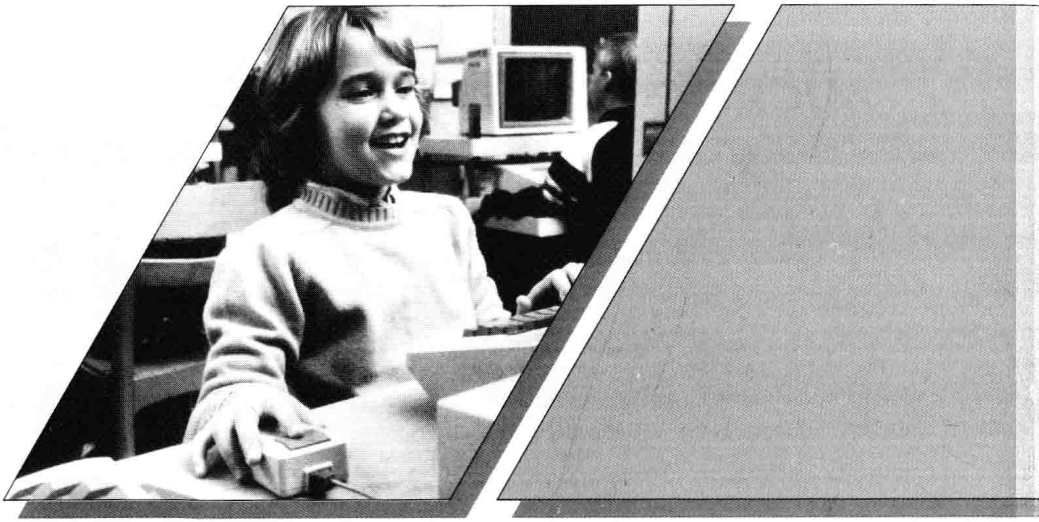

CHAPTER 1

THE MICROCOMPUTER IN EDUCATION

Objectives

- List features of the computer that make it an effective teaching tool
- List several ways in which computers are used in schools
- Explain how computers assist in special education
- Describe various ways of setting up computers in the schools
- List a number of hints to help teachers use computers most effectively

Key Terms

analog computer
applications software
CAI (computer-assisted instruction)
CMI (computer-managed instruction)
computer
computerphobia
data
data processing
digital computer
downloading
graphics
load
memory
nanosecond
network/networking
programs
software
speech synthesis
stand-alone systems
terminal systems
tool software
uploading

When we visualize a classroom, we usually imagine blackboard-lined walls, rows of desks and chairs, books lined up on shelves, bulletin boards, and a teacher's desk located prominently in the room. Most classrooms look this way—you have to look very closely to see that the ordinary-looking classroom is undergoing a quiet but powerful revolution.

Did you notice the microcomputer in the corner? Not at first glance, perhaps, but that is where the revolution is taking place. Computers may not change the way the classroom looks—although in some applications they do just that—but they *are* changing the way education happens. Even in classrooms without computers, the revolution touches teachers who debate what and how much they teach their students about computers to prepare them for our highly computerized society.

This is a classroom with a microcomputer.