

# Computer-aided Education

A. K. M. Mahfuzur Rahman Khan

008

**MICROCOMPUTERS**, during the recent past, have proved to be powerful educational aids for giving active instructions to students of schools, colleges and Universities. Appearance of cheaper and more powerful models of microcomputers every year in the market, give fresh boost to the prospect of widespread use of microcomputers in this respect. Terms like CAE (Computer Aided Education), CAI (Computer Aided Instruction), CAL (Computer Aided Learning) and numerous others of this type are becoming popular words in educational environment. Because of late and slow growth of microcomputer technology in this part of the world, educational use of microcomputers is still in infancy in this region. This Regional Meeting offers us an appropriate forum to project the status and prospect of Computer Aided Instruction in Engineering Education in Bangladesh. There are over 90 million people within an area of 55,000 square miles, has an adult literacy rate of 29.2 per cent. Economy of the country is predominantly agro-based. Table 1 gives a brief picture of the educational infrastructure of the country as at 1982-83.

APPLE, IBM PC, IGM PC, XT, TRS-80, Tandy 2000, SORD and Decision Mate. Most of them are 8-bit machine. Of a number of 16-biters with mass-storage facilities have been collected by research organizations, Universities and Engineering Colleges. A National Computer Committee (NCC) has been formed in 1983 to see that the right type of computers are being acquired, proper environment is being maintained to get the maximum utility out of the acquired computers, appropriate technical skill is being reared up inside the country to utilize the computers in a better way.

**ENGINEERING EDUCATION** in Bangladesh has three distinct levels—Certificate, Diploma and Degree. To enter a 2-year certificate course, a student needs to receive eight years of formal education in a school. To enter a 3-year Diploma Course he needs ten years of schooling or a certificate in relevant trade.

10 THE BANGLADESH OBSERVER

## Computer-aided Education

THE BANGLADESH OBSERVER (from page 9)

and engineering organizations. The Diploma level technicians and Degree Engineers make the mid and high level technical manpower. Computer use in Engineering applications is being done through the middle and high level technical personnel and computer experts. With resources permitting it, microcomputers can fruitfully be used as educational aids to the Degree and Diploma level students. Efforts in limited scale are at hand in this respect.

Engineering applications of microcomputers in Bangladesh centre around the following fields:

—Computer-aided design, Simulation of Engineering systems, Evaluation of engineering projects, Project planning and training of engineering personnel.

### THE MAJOR USERS OF COMPUTER

**BANGLADESH UNIVERSITY OF ENGINEERING & TECHNOLOGY (BUET)**: (a) Computer-aided design, (b) Computer-aided study of existing and planned systems, (c) Computer as an aid to educational management and (d) Computer Aided Instructions.

### BANGLADESH POWER DEVELOPMENT BOARD (BPDB)

(a) Scheduling of Electrical Power Generation, (b) Load Flow Study, (c) Project Evaluation and (d) Inventory control.

**BANGLADESH TELEGRAPH & TELEPHONE BOARD (BT&TB)**: (a) Training of Engineering personnel.

### PLANNING COMMISSION

(a) Project evaluation and (b) Energy planning.

### RURAL ELECTRIFICATION BOARD (REB)

(a) Computer-aided Design.

### BANGLADESH GAS FIELDS

(a) Computer-aided network planning.

### MASTER PLAN ORGANIZATION

(a) Computer-assisted planning.

### ENGINEERING COLLEGES

(a) Computer-aided Design.

### ENGINEERING CONSULTANTS

(a) Computer-aided design and (b) Computer-assisted planning and evaluation of project.

### EDUCATIONAL USE OF MICROCOMPUTERS

Like many other countries, Bangladesh

importance. Computers used in educational and research organization have the bulk of educational users. Of the educational users, only a portion uses computers as educational aids.

Educational use of microcomputers has three main streams:

—use of computers as computing machine, use of computers as teaching aids and use of computers as educational management tools.

Work on the first stream is a common-place with any computer. Computers, as computing

machines, are being studied extensively in BUET. Also similar studies are performed in limited scales in Engineering Colleges and in some general Universities. In BUET, work on the second and the third streams are performed in modest scales. Technical papers to be presented in this meeting will bear testimony to this claim. Besides this, computer as a purely educational aid is being used by BT&TB where training classes are conducted through interactive computer terminals connected to a host computer through a network controller.

BUET acquired IBM 370/115 in 1979. Before that, teachers, students and research workers of BUET had been using IBM 1620 machine at AEC and IBM 360 machine at BBS. The use was mainly for research purposes.

With the acquisition of IB 370/115 in 1979 IBM 4331 Ko2 1984 Computer usage in BUET has gained wide popularity amongst the undergraduate students. Students of all branches of Engineering learn computer programming as compulsory courses during the first two years of their undergraduate studies. Computer Centre of BUET offer in average at least three short courses on programming languages to outside user each year. These include Fortran, Cobol and Special Package Programme. Graduate researches on computers and computer usage relate to development of utility softwares, building design, electrical load flow study, System simulation, Reactor design, Reverbflow study ship design etc. Computer Engineering Department has an extensive programme to study microcomputers and microprocessors and their applications.

BUET collected microprocessor kits with Motorola 6800 and MC 6502 processors in 1980. These are used to teach digital techniques to undergraduate Electrical and Electronic Engineering students. Acquisition of TRS-80 model 16 and Viking Computer during 1982 and 1983 has created a right environment for extensive computer usage in undergraduate curricula. Four more computers, one IBM PC, XT, one IBM PC, one Tandy 2000 and one Monroe MS2000 with multiuser facilities has been commissioned in BUET during the early part of 1985. There

puters in the undergraduate course curricula.

Computer Engineering Department of BUET now offers Post-graduate courses leading to M.Sc. and Ph.D in Computer Science and Engineering Subjects. The department is planning to offer undergraduate courses soon. Research activities in the department includes microprocessor based system design, computer software development, Computer Aided Instructions etc.

Because of the rapidly changing technology of present day

life course contents of technological studies tend to become outmoded even after a few years of introduction. To cope with this changing situation, microcomputer aided instructions makes a prospective means. Cheap and powerful microcomputers now available in the market can very fruitfully be used to give active lessons to students. Cheap, though it is in the world market standard

 জন্ম ... 0.7 JUN 1985 ...  
 পৃষ্ঠা ... ৭ ...

in Bangladesh to afford a microcomputer for each class is still beyond their means for most educational institutions, even for BUET.

Conclusion: Microcomputer hardware and software resources as possessed by a country like Bangladesh can be used only in a very limited scale for giving computer aided instructions to raise better trained engineering graduates. However the need of the time calls for such an effort immediately. Regional cooperation may be very helpful in this respect.

জন্ম ... ৭ ...

adult literacy rate of 29.2 per cent. Economy of the country is predominantly agro-based. Table 1 gives a brief picture of the educational infrastructure of the country as at 1982-83.

The number of students in secondary schools is 2,45,800 and teachers in secondary schools 89,649. Students in colleges 1,84,852 and teachers in colleges 7,850. Students in Universities 39,699 and Teachers in Universities 2,484. Students in Vocational Institutions 4,500 and Teachers in Vocational Institutions 358. Students in Polytechnic Institutions 16,206 and Teachers in Polytechnic Institutions 851. Students in Engineering Colleges 1,709 and Teachers in Engineering Colleges 152. Students in Engineering University 2,761 and Teachers in Engineering University 226.

This shows that only a minor fraction of the students and teacher population is engaged in technical and engineering education. Necessary physical facilities available for technical and engineering education are too meagre to help it grow in the usual manner.

### BANGLADESH AND COMPUTERS

Bangladesh entered digital computer age in 1984. The first digital computer an IBM 1620 machine installed in the Atomic Energy Commission (AEC), Dhaka, served research workers of AEC, Dhaka University, BUET and other Universities and research organizations in and around Dhaka. During the late sixties, some Financial Institutions acquired mainframe computers for purely commercial data processing. Bangladesh Bureau of Statistics (BBS), a government organization, acquired an IBM 360 machine in 1975. This gave services to the Universities, research organizations and government offices besides processing Government Statistical information including National Census data till it was damaged by an accident in 1980. An IBM 370/115 machine was installed in BUET in 1979. Since then, this has been giving services to the research workers, graduate and undergraduate students of BUET and other Universities, Engineering and Commercial Organizations, research organizations of Dhaka and Chittagong. During the last five years at least half a dozen more mainframe computers including two IBM-4341, two IBM 370/115, two NCR 9300 have been commissioned in Dhaka. Two IBM 4331 and two more NCR 9300 are going to be commissioned soon at Dhaka and Chittagong.

During the last five years more than 20 minicomputers have been put to work in Dhaka and Chittagong. These are doing specific types of jobs as demanded by the organizations having their control. One managed by Bangladesh Bureau of Educational Information and Statistics (BANBEIS), an IBM S/34 machine, is engaged in processing data for educational management only.

Bangladesh has a big collection of microcomputers varying from small Sinclair to big HP2000. Common games are

Entrants of a 4-year Degree Course generally receive twelve years of general education with special emphasis on pre-engineering science subjects or possess Diploma in the relevant branch.

In Bangladesh there are 64 vocational institutions giving certificates, 17 Polytechnic Institutions giving Diploma and four Engineering Colleges and one Engineering University giving Degree in different disciplines of Engineering education. The University also offers post-graduate degrees and caters for researches on Engineering problems.

Certificate level technicians make the lowest level skilled manpower engaged in public and private sector industries (See page 10)