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ABSTRACT

At Gallaudet College, additional computer hardware has been required to meet the computer needs of administration, faculty, and students. Used in such disciplines as English, mathematics, chemistry, and foreign language; computer assisted instruction has proven particularly helpful in teaching the deaf. (EMH)

GALLAUDET COLLEGE UPDATE

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Gallaudet College installed a time-sharing DEC System 1050 with 16 lines in 1971. The system replaced an IBM 360/30 batch processor. Utilization of the batch system was low and it was felt that a time-sharing system would improve that situation as the computer was made more readily accessible to users. It was hoped that creative faculty and students would exploit the system when they became aware of the ease with which they could use the power of the computer.

The initial hunch proved correct and the use of the computer has grown steadily. The system was gradually expanded to 48 lines and by December 1974 Kevin Casey, Director of the Computer Center, called my attention to the fact that the system was showing occasional saturation. Forecasts of planned use made it clear that the system would be heavily saturated in the near future and that moving work to less attractive work shifts would not eliminate the problem. There was a definite need to upgrade the speed of the central processor and to add additional lines. This, of course, implied additional changes.

In July of 1975 we converted to a KI processor and brought the number of lines to 72. The principal components of our current configuration are:

1 KI10 Processor

2 TU70 Tapedrive (high speed) 1600BPI/200ips

2 TU20 Tapedrive (800BPI/45ips)

4 Dectapes

5 RP04 Disks (@ 20.4 million words)

256 K words Core Storage

1 DC76 Communication Processor with 72 lines (45.5 baud to 9600 baud)

supported by the necessary controllers.

Kevin established a stringent acceptance testing procedure which was incorporated into the contract for the new equipment. I am pleased to say the subsequent transition was quite smooth.

The KI has effectively doubled our processor speed. Within six weeks following the installation of the new equipment Kevin had requests for six more lines.

The new procurement was a two step procurement and the KI processor will be replaced in July of this year with a KL processor. Tests have shown that the KL should give us approximately five times the speed of the original KA, depending upon the type of program run.

The system serves the administration, the faculty, and the students. There are few offices on the campus today which are not using or contemplating the use of the system. The Business Office is a heavy user. Registration is done on line. The Office of Demographic Studies, a research

component, is a major user. This broad base of interest and support for the computer has permitted us to encourage exploration with the use of CAI.

I will confess that, when wearing a different hat in a different setting in the past, I recommended against the use of CAI for most applications. I started doing that formally in 1966. I did it, not because CAI could not be of extremely great value to education, but because of the cost of hardware and instructional software. I also had serious doubts about the availability of the necessary dedication and persistence to produce a meaningful volume of instructional software. I still hold that opinion for the most part for general education.

I have behaved somewhat differently, however, when considering CAI for persons who are deaf. I am overwhelmingly impressed with the educational difficulties faced by a human who has been born without an ability to hear or who has lost that ability before acquiring the language of his or her culture. It is inappropriate for me to go into the language problem here. My point here is simply that the problem is of such a magnitude that I believe it justifies experimentation with the use of CAI. I do not know where it will lead us, but if we find that we can establish valid educational programs which incorporate CAI as some part of the total system I suspect that it will justify the cost.

I would like to turn now to some of the CAI developments at Gallaudet. I reported last year that we supported the use of the Stanford Mathematics Strands CAI programs by the Model Secondary School for the Deaf and the Kendall Demonstration Elementary School. That support continues. The students are using 15 Teletype terminals five days a week from 9:00 A.M. to 3:00 P.M.

We are also continuing the Russian Language course which I mentioned last year. This application uses a single Model 35 Teletype with a typebox modified to provide both the Cyrillic and the English alphabet. The printout paper is prepunched and perforated so that the students end up with a book containing some 25 lessons each year.

Additional work is going on. You will hear later this afternoon from Jim Madachy and Doug Miller about their use of CAI in support of the English Language Program at Gallaudet. The need to provide the English Language Program with 10 CRT terminals for CAI this past fall contributed to our need to upgrade the system. Jim and Doug have made significant progress in the past year and their enthusiasm has been appreciated.

Donald Peterson, Associate Professor of Chemistry, has developed or acquired more than 50 CAI programs for use by freshman chemistry students. The programs provide drill and some simulation. For example:

- Incomplete chemical equations are given from a data bank. The student adds the missing compound and balances the equation.

- Students are presented with randomly generated formulas from a bank of cations and anions. The student can drill on naming the formula or giving the formula for the compound or receive a random mixture as the chose. Errors are analyzed if the wrong name or formula is given.

- An oxidation-reduction titration is simulated. The operator adds the titrant in increments desired and EMF values are printed out. From these values the student determines the end point of the titration and the concentration of the unknown sample.

The students' work is not graded. The programs are available for practice. A file is set up on each student and Don can call for a listing of all students who have worked on a given program or for a list of all programs worked by a particular student. A look at the listings shows that considerable use is made of the programs and that students vary in the amount of use they make of programs.

Donald Bangs, Instructor in Mathematics, has developed 18 programs for use by students in a preparatory year mathematics course. The programs accompany a self-instructional text which Don has under development. Students who fail a posttest in the instructional sequence are required to work the relevant practice exercises. In some exercises the student is given a choice of approach to the problems, i.e., he can begin with easy problems and progress to difficult problems or receive a mixture of easy and difficult problems. The drills cover such things as:

- Long division
- Factoring
- Solving linear equations
- Determining the slope and intercept of the graph of a linear equation
- Determining the equation of the line given the slope and intercept

Some of the programs provide additional explanation for the student and solve the problem if the student makes an error.

The computer is also being used in support of a German course. Louis Townsley, Associate Professor of German, has worked with a student knowledgeable of the computer to establish practice computer exercises to accompany a book written by members of the German Department. The student received academic credit for the material development. Programs

developed for the first year of the course are in need of revision; however, programs developed for the second year are used operationally. Students are encouraged to use the practice materials. The materials give practice on the main grammatical points and the new vocabulary of a chapter. If the student gets into academic difficulty, he is required to use the computer drills or obtain tutorial help from the Tutorial Center.

Robert Harmon, Associate Professor of German, is working on a more comprehensive CAI package. The German Department sees value in what has been done to date. Bob believes that individualized instruction is especially well suited to the study of foreign languages because: it permits more active involvement of each student, can assure that each student has mastered the material in a lesson before proceeding, and permits each student to progress at his own rate of speed. He sees the CAI material in German as supplementing classroom teaching rather than replacing it completely.

Bob has been working on grammar exercises correlated with the text written by the department and hopes to complete these lessons soon. A new assignment at the college, however, may postpone the completion of these materials. He intends to branch students to review the lesson if they score below 70 on the lesson. If they score between 70 and 80 they will be given the option of reviewing or proceeding. Students will be told why they are wrong if they make errors in the course of their study. They will also have an option to receive review information at selected points in the lesson.

I have discussed vocabulary drill with Bob and suggested the possibility of random presentation of vocabulary words with an adaptive capacity to remove words from the study list which the student has mastered and to retain words missed. The INSTRUCT language which Bob is using will not permit this and I have discussed with Kevin Casey a modification of the GNOSIS language to permit it. Writing that ALGOL patch is now one of many projects on the Computer Center list of things to do.

In general, Bob is optimistic that his project, when implemented, will provide a valuable teaching method.

The Model Secondary School for the Deaf, on the campus of Gallaudet College, will be acquiring a TICCIT system in the near future. The system will provide the school with more than the CAI function. We will be hearing about that system later this afternoon. The college anticipates an interface with that system via two 9600 baud synchronous communication lines. This link will permit TICCIT terminals to reach the college DEC System 1080. At that time CAI applications would presumably be handled principally by the TICCIT system.

The college will continue to explore CAI. Experiences to date have been positive. A number of teachers are clearly interested and I anticipate that that number will grow.