'None of the normal apathy'

Mathematics by machine adds up

By Bev Bennett

The computer mathematics laboratory at George Washington High School is noisy, cramped and littered with paper wads. It is also a model of creative math instruction.

The purpose of the laboratory is to take the blah out of math. Advanced students learn partially by programming lesson plans for other students. The less advanced benefit from this curriculum and also devise their own.

Judging from the intent faces of those at work in the lab, it keeps the customers satisfied — and much more interested in the sometimes mundane ways of mathematics.

"WHAT'S NEAT IS, these kids are really working," instructor Dr. Irwin Hoffman said. "There's none of the normal apathy."

Also an instructor in the course is Arthur Durand.

Hoffman, who bubbles with enthusiasm at the mere mention of the click-clacking machines in his classroom apparently has had little trouble in convincing school personnel of the program's worth.

The department has four Teletypes, more than any other school in the district and several programmable calculators.

IN ADDITION TO the department's leadership among Denver schools, it has become nationally known. George Washington was one of two schools chosen for a recent University of Pittsburgh study to determine "how kids learn math and how to get them to want them to learn," Dr. Hoffman said.

The study was financed by the National Science Foundation.

In the computer laboratory at George Washington students can write computer programs and feed them via Teletype into a central computer in the district office.

William Goe, supervisor of mathematics for Denver Public Schools, said the computer is activated by telephone. When a student calls its number, the machine "answers."

THE STUDENT PLUGS the telephone receiver into a device which connects the Teletype to the computer, then types his program.

The programmable computers, which have their own memory units, are not linked to the central computer.

Students may enter and leave the laboratory freely. "There are no restrictions — unless they're flunking all their courses," Dr. Hoffman said.

He pointed to a student who had been flunking, specifically, math. The boy designed his own learning program through the computer, spends five to six hours a day in the lab and is finally making progress.

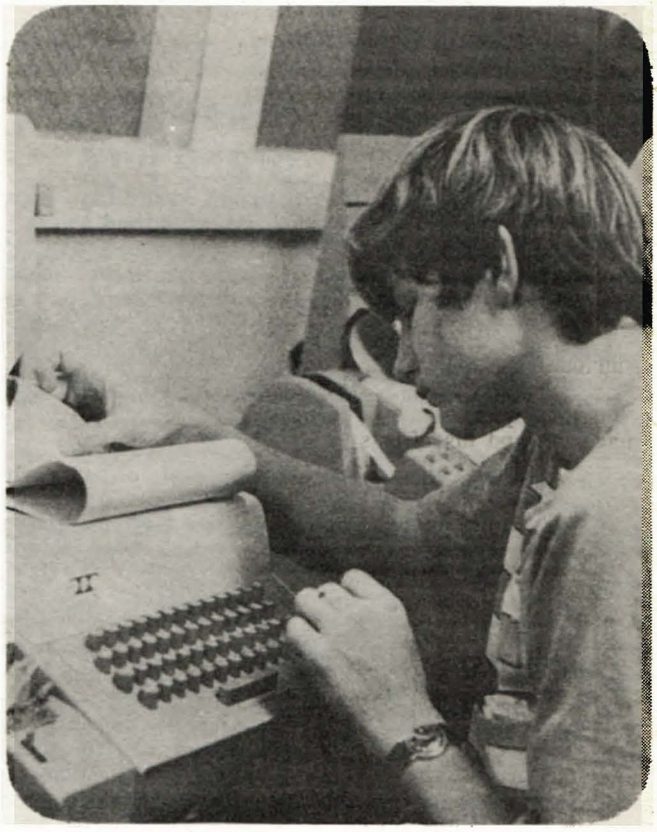
AT THE OTHER end of the spectrum, students with high potential in mathematics program teaching plans for fellow classmates in the department's consumer math class.

One lesson allows students to determine the best way to finance a car. The student learns by typing answers in response to questions which the computer "asks" on paper.

"First it is necessary to know whether you will be getting the money you require from a bank, a dealer or from a credit union," the machine types.

The student types the appropriate financial source. The computer figures monthly payments on the basis of considerations such as the amount of down payment and whether a trade-in is involved.

STUDENTS MAY COMPARE cost by choosing all three methods.



Car payments made easy.

Students Karen Barker and Lori Gudmundson programmed a lesson which traces the job of a pickle factory employe. Through it the girls introduce their classmates to the intricacies of payroll deductions and unemployment compensation (the employe injures his hand on the job).

After viewing the story, programmed for slide production on a small screen, students can write their own "paychecks" — again, in response to questions "asked" by the computer (such as number of social security deductions and hourly pay rate).

The computer is also used as a teaching tool by students in other classes at George Washington. Electronics students use the lab to draw graphs, for example and a social science class has requested programming to study the impact of simulated car pooling.

"WE'RE TRYING TO develop novel teaching experiences," Dr. Hoffman said.

Although all high schools in the district have computer math laboratories, George Washington is apparently the leader in creative programming.

The potential benefit to all Denver schools was a major consideration in the award of a $12,820 "Program of Excellence" grant to the department last year.

"Dr. Hoffman has been pioneering work (in computer mathematics)," Goe said. "He believes it has merit for the district as a whole."

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