

PROJECT CALCULATOR

Marshall P. Bye

Mr. Bye, past president of MCATA and consultant in mathematics for the Calgary public secondary schools, describes two exciting experiments in the teaching of mathematics with the help of calculators at the junior high school level.

"Students are asking if they can return after school to finish their math assignments."

"Students, during assemblies that run over into the math classes, are asking to be allowed to return to their math classes."

"Students are readily answering: $2 \times 19 \frac{3}{4} = 39 \frac{1}{2}$."

"Students are performing 5, 6, 7, or more step problems without assistance."

You may ask, "What is so different about all this?" Many teachers may not see anything different in this, but to two teachers in particular these 'happenings' are rewards for the extra work that has gone into two projects: *Project Calculator I* and *Project Calculator II*. The young people described above are not average students. They have been failing mathematics for years; some have not passed a math course since Grade II. They have hated mathematics. These students attend the junior and senior vocational mathematics classes being offered by two academic-vocational schools in the Calgary public school system.

There are two separate experimental projects under way at present. In the Van Horne Secondary Vocational School, Principal D.B. Murray and his mathematics teachers were searching for an approach to mathematics suitable to a special group of Grade IX students. This new program would have to be suitable as a terminal mathematics course. It would have to be different and yet provide practice in computation and problem-solving. The staff was looking for a program that would change the attitude of students with an extreme dislike for mathematics - a dislike caused by continual and prolonged failure. This program, then, would have to allow the student some measure of success daily. The staff was aware of the positive effect which the shop classes (in automobiles, food servicing, and the like) were having not only on the students' attitudes but also on students' achievement in general.

In the Ernest Manning Academic-Vocational High School, Assistant Principal D.B. Dack has long been concerned about a suitable program for students in the vocational program. He solicited the cooperation of R.M. Radomsky who was teaching mathematics to this group. The two teachers assessed the type of students in question. The students, in general, had poor behavioral patterns in class and in the school. The ability of the students was generally low and the attitude of the group towards mathematics was negative.



Photo - Calgary School Board, Instructional Aids Department

C.S. Swaney with two students in *Project Calculator I*
at Van Horne Secondary Vocational School, Calgary

In September, Olivetti Underwood offered, on loan, 18 Divasumma Calculators for Ernest Manning and 10 for Van Horne School. The writer, while at the NCTM meeting in Las Vegas last April, had gathered some information and suggested lesson plans from "Concepts and Applications of Mathematics Project" (CAMP). This information was for calculator-centered mathematics courses and related to the use of low charts.

At Van Horne, C.S. Swaney worked these ideas from CAMP into his own thinking, and this is how *Project Calculator I* was born. Mr. Swaney is building a course centered around the use of the calculator to meet the interest and needs of the students. Among other advantages, the calculator develops interest and puts 'activity' into the math program. It provides a measure of success. Mr. Swaney and those associated with this project are amazed at the

level of achievement which the students are attaining and the changes in attitude towards the mathematics classes. The project continues.

At Ernest Manning, Principal T.T. Humphrey gave approval for R.M. Radomsky to teach *Project Calculator II* to three classes of Mathematics 15. Mr. Radomsky built his course to augment the current textual material and to encompass topics that are related to other vocational subjects. He found that the student could handle difficult and complex problems much more rapidly and to a greater extent than he had expected. The students could master a large number of problems daily and wanted more problems of a more challenging nature. When asked how the project was proceeding, Mr. Radomsky commented "Just come in and watch the students. See for yourself." I did just that. I saw students working diligently, in pairs, often one helping the other. There were no discipline problems. A student raised his hand and asked if he could come back early at noon to finish his assignment. I saw students do mental



Photo - Calgary School Board, Instructional Aids Department

R.M. Radomsky with a mathematics class in *Project Calculator II*
at Ernest Manning High School, Calgary

calculations with confidence, far beyond the level at which they were able to work just two months before that time. Many other positive changes were observed. I was convinced of the success of the program.

The second semester will soon start at Ernest Manning. Mr. Humphrey has given approval and support to the institution of a research project during the semester. Mr. Radomsky, with the assistance of Mr. Dack, will carry out a carefully tested and controlled experiment. N.J. Cameron, principal at James Fowler High School, is providing a comparable group in his school to be used as a control. In addition to testing, Mr. Radomsky will prepare material for a workbook text that can be used by other teachers. It is hoped that the data collected from this experiment will support the hypothesis that *Project Calculator II* results in a positive change in attitude towards mathematics, an increase in problem-solving ability, and an increase in ability to perform simple computation.

Perhaps it is too early to predict with sophistication the exact effect of the extended use of calculators in mathematics, but the results being obtained are exciting, promising, and favorable.

Project Calculator is launched.

Algebra is the intellectual instrument which has been created for rendering clear the quantitative aspect of the world.

Alfred North Whitehead

School teacher to waiter in restaurant: "Well, Hubert - I can't say your addition has improved any since I had you in sixth grade."
