

**THE USE OF PROGRAMMED ARITHMETIC MATTER WITH  
CHILDREN IN THE SEVENTH AND EIGHTH GRADES  
AT WILBUR L. CROSS SCHOOL IN  
BRIDGEPORT, CONNECTICUT**

**AN ABSTRACT OF  
A THESIS  
PRESENTED TO THE GRADUATE FACULTY  
OF WESTERN CONNECTICUT STATE COLLEGE**

**IN PARTIAL FULFILLMENT  
OF THE REQUIREMENTS FOR THE DEGREE  
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If educators are willing to look beyond the traditional approaches, they should study the progress which has already been made in laying the foundations for developing a practical, economical, and broadly applicable method of individualized instruction for our schools. Existing texts require constant talking on the part of the teacher and few responses on the part of the students. Programmed instruction, on the other hand, requires little talking by the teacher and maximum participation by the student.

Programmed instruction is not of recent origin. It did not become fully developed until the last fifteen years. Socrates is considered to be one of the earliest programmers of geometry. Sidney L. Pressey, who began his work in the 1920's, is generally conceded to be the father of the teaching machine. B. F. Skinner, a behavioral psychologist, experimented with the conditioning of pigeons to perform desired actions. In the late 1950's, Skinner turned his attention to the field of education and constructed devices known as teaching machines. He also developed what is known as the Skinnerian method of programmed learning. Norman Crowder opposed Skinner's methods of programming and devised his type of programmed learning known as the branching technique. In the late 1950's and early 1960's, numerous industrial organizations have undertaken

programs to test the effectiveness of programmed instruction. The United States military organizations have made their contribution to the field of programmed instruction.

Programmed instruction is a method of teaching in which subject matter is broken down into a series of short instructional steps called frames. The heart of programmed instruction is immediate reinforcement. The student knows immediately, after reading a frame and writing his answer, whether he is correct or not. The student self-paces himself, and is actively engaged throughout the whole program.

Using the technique of programmed instruction, the author presented a unit in modern mathematics to the seventh and eighth graders at Wilbur L. Cross Elementary School in Bridgeport, Connecticut. The study was conducted with ninety students in these two grades. The author constructed a programmed unit of 305 frames distributed over forty-one pages on a non-decimal base system, namely, the base six system. This program was prepared using the format of linear programming which requires constructed responses.

This base six system presented the students with something new and exciting, while providing the means for developing some of the basic concepts and understandings of the decimal system of notation. It also served as a means of reviewing some of the fundamentals of arithmetic, and strengthened the idea of place-value. There was improvement in changing from the base six system to the

base ten system and back again, and, more important, there was a better understanding of the decimal notation system.

The effectiveness of this study was checked by administering a thirty-seven-item pretest and posttest and comparing the results. All the students showed an increase in the number of correct items gained on the posttest. The results seem to justify that programmed instruction is a satisfactory method of teaching the base six system.