Could there be a little bit of truth in the statement that, in education, if you're old-fashioned long enough, you'll be modern!

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HAVE YOU TRIED YOUR HAND AT PROGRAMMING? by Ruth Godwin

Editor's Note - Dr. Godwin is associate professor of education at the University of Alberta, Edmonton. During the summer of 1962 she participated in a programmed instruction seminar at Columbia University.

Most teachers have heard or read something about programming, but how many of them have tried to produce a program? Probably not enough. And yet, who has a better chance of writing a successful program than the able teacher who, through many years of classroom experience, has learned much of what students can learn and how they accomplish their learning?

Let us presume that you have read one or two articles on programming, that you have worked your way through a program (or more), and that you are ready to start programming. What follows is a brief (perhaps

too brief), do-it-yourself guide for the writing of a linear program. Do what is required, step by step, and you should end up some months from now with a bit of programmed instruction and a wonderful feeling of accomplishment.

1- Review what you know about programmed instruction and do a bit of thinking about what might (or might not) be programmed in mathematics.
2- Choose a small item of information to teach. Define it as precisely as you can, remembering that you must take the student from where he is to where you want him to go in a series of small steps, mostly by way of socratic questioning.
3- Write a small statement, a "step" which is large enough for the student to take without being bored but small enough for the learner to complete successfully. (The student is always right in programming. Compose frames of such difficulty that the average student will be able to give the correct response to almost all of them.)
4- Write another statement, another and another, each building on its fellow until you teach whatever it is that you have decided to teach. Have the student compose rather than copy answers.
5- Use cueing techniques with whatever frequency you think that you should, especially in the initial frames, to help the student learn what you are determined to teach him. Cues can take several forms, such as: (a) partial presentation of a word (some or almost all letters omitted), (b) similarity of grammatical construction, (c) constriction of the range of response by grammatical construction, and (d) visual cues (e.g., italics, underlining, color).
6- Avoid the dullness of repetition by: (a) varying the context of each additional problem, (b) introducing new information related to a particular problem, and (c) requiring discriminations to be made between two or more problems separately accomplished in the past.
7- Vary your presentation by using some (or all) of the following types of frames: (a) lead-in items - to prepare a student for new information, (b) augmenting items - to supply additional new information, (c) interlocking items - to review what has

been learned in addition to the presentation of new information (d) restate-review items - to rehearse an established (you hope) skill, (e) generalizing items - why explain this one to teachers?, (f) specifying items - to make use of a learned item in an illustrative case.

8- As you compose your program, follow this procedure: (a) use a 4x6 card for each frame, placing the completion on the back of the card (otherwise you won't be able to pupil-test efficiently make revisions, etc.), (b) give carefully-worded directions, (c) pay particular attention to transition, (d) student test your items, and (e) revise by adding more frames, writing a more precise bit of exposition, providing better (or more) cues, or giving an example or illustration.

You're on your own! One last word of caution: pupil-test, revise, and pupil-test again and again until you get about a 90 percent efficiency level for your program with average students.

Once you get started, you'll find programming a pleasurable activity (somewhat akin to the solving of crossword puzzles), and you'll find that it teaches you more than you thought it would about how children learn.

Have fun!

A CRITICAL ANALYSIS OF THE USE OF THE RATIO TEST IN COMPUTATION OF PROPORTIONAL EQUATIONS, by H. L. Larson

Editor's Note - Mr. Larson is superintendent of schools in Ponoka, and is president of the Red Deer Regional of the MCATA.

One outstanding feature of modern mathematics in elementary schools, as introduced by Scott Foresman texts, is the use of rate and ratio in solving problems. There is little doubt that Grade VI students can and do understand the first step in setting up the equation. Recognition of rate sense in so many problems and use of a placeholder to complete the open sentence is a startling innovation in the solution