A COMPUTER PROGRAMMING APPROACH TO TEACHING SAMPLE SIZE

Dr. Robert E. Good, Portland State University

"How big a sample will be needed?" is a frequently asked question in the field of marketing and part of the educational agenda for many courses. Textbook treatment of this topic is often less than satisfactory. The purpose of this paper is to show how the computer can be used to help students understand the sample size determination process with greater clarity.

If the educational objective were to provide a mechanical way to compute sample sizes, then a sample size program could be provided and run by students. However, if the educational objectives include such things as development of thinking, understanding, and problem-solving skills, then merely running a canned computer program would be of questionable educational value. A much more active role is needed for the student.

Techniques associated with computer programming can provide the systematic approach to sample size computation that is needed. As Nevison states in his book entitled, Executive Computing, "... writing a program is a way of analyzing a problem." It also provides an approach to operationalizing marketing concepts and promoting algorithmic thinking. The problem solving methods borrowed from the computer field for use in understanding sample size determination include top down design, stepwise refinement, modular design, if-then action branching, HIPO (hierarchy, input, processing, output) structuring, and logical flow diagramming (simple boxes and arrows).

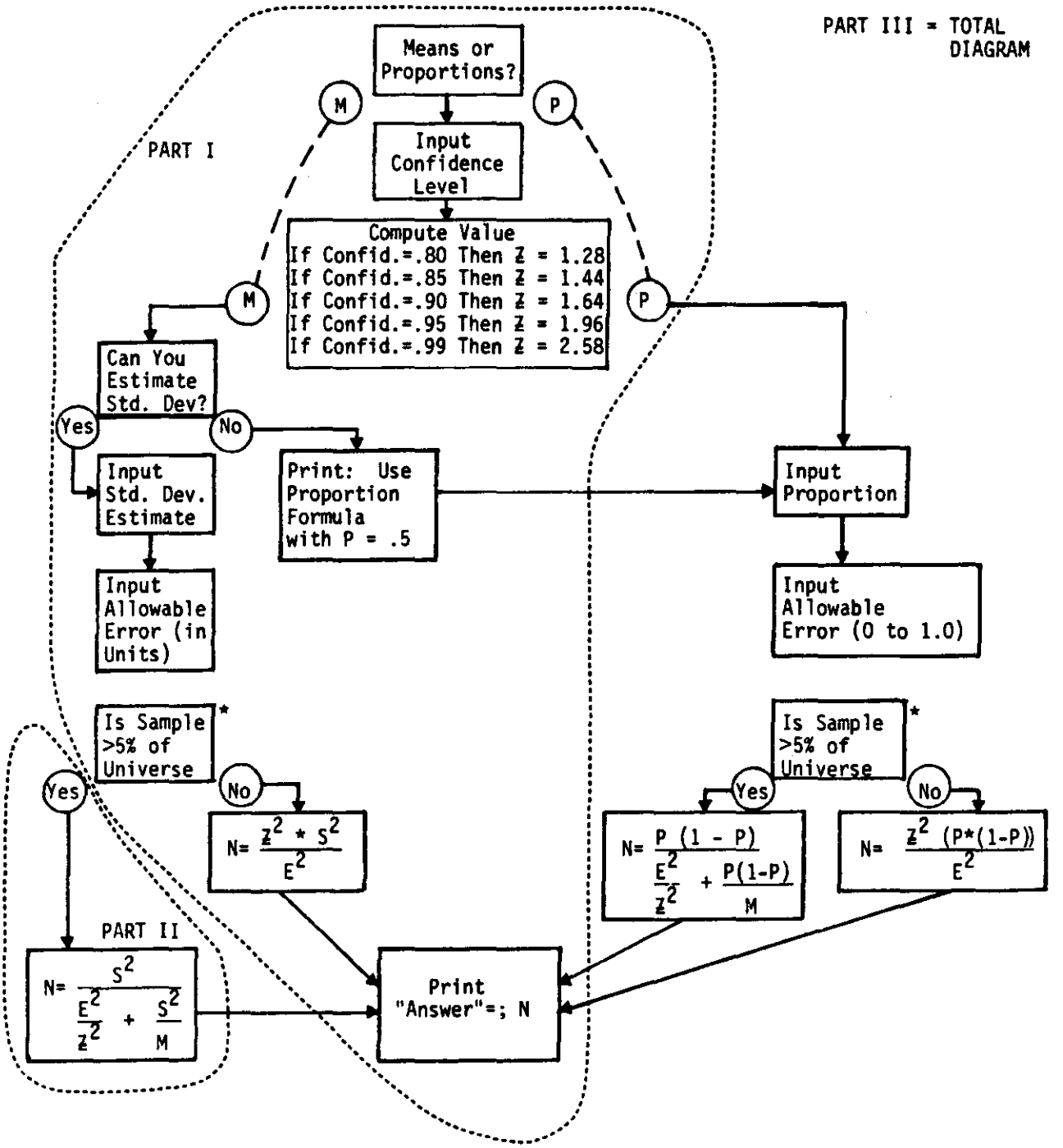
The approach taken consisted of providing a case description with clues and essential information about sample size issues embedded in it. The student then develops a logical flow diagram for sample size determination and eventually writes a computer program if skills permit.

The sample size case exercise has been used at both the graduate and undergraduate levels with very positive responses by the students. The flow diagrams are required, but actually writing the computer program can be optional. Usually, many students do elect to write the computer program.

Having completed the exercise, the students will have learned three lessons. First, they will have a clearer understanding of how to compute sample sizes for simple random samples (for means or proportions) with and without finite correction factors. Second, they will have gained some knowledge of and practice with problem solving approaches associated with computer programming. Third, they will have gone through the process of building a management tool (i.e., a computer program) which is a convenient and reusable embodiment of their understanding. (See accompanying teaching note).

TEACHING NOTE

SAMPLE SIZE



*If user does not know whether the sample will be >5% of the Universe then run the program assuming "No" first; then run the program a second time if the sample does turn out to be >5% of the Universe.