THE USE OF A TRANSPARENCY MASTER BOOK FOR TEACHING STATISTICS

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Transparencies have three considerable advantages over a blackboard presentation:

1. They allow a teacher to constantly face the audience and thereby better sense the proper pace and the interaction opportunities.

2. They permit the teacher to adhere to a predetermined level of organization.

3. They allow the neat presentation of diagrams, data or other detail without requiring the time and care necessary to put this on the board.

On the other hand, blackboard presentations have their own advantages (including that of retaining earlier information without erasure because of the availability of more space). Probably, the optimum teaching situation for a modest sized class is a properly balanced use of blackboard and transparency projections. For large classes in large lecture halls (typical now at American universities), the author's opinion is that, for the most part, the class should ordinarily be taught via transparencies.

Many teachers, particularly in large classes, would like to make use of transparencies in their teaching but fail to do so because of a lack of skills for their production or the extensive amount of time required to produce any reasonable number of transparencies. Also, commercially available transparencies are expensive and usually of not too much pedagogical value to the individual teacher. They often have the wrong notation or lack the desired amount of detail. Consequently, there is a need for some form of assistance that would enable a teacher to quickly and inexpensively produce a good set of transparencies for use in the classroom.

In recognition of this need the Audiovisual Instructional Materials Committee (AVIM) of the American Statistical Association has developed a set of over 200 basic transparency masters. This set in book form will be published jointly by A.S.A. and the Wadsworth Publishing Company. These masters were developed for the noncalculus introductory statistics course but many of them will be useful in other courses even those of mathematical persuasion. These transparency masters were developed under the philosophy that these should be basic (even elementary) transparency masters, that they should be primarily non-textual and, that to a large extent, they should focus on material that a teacher would like to put on the board but does not do so because of lack of time or drawing ability. These masters will enable a teacher to make a number of useful transparencies for about 25 cents each. The production of a transparency from a good master is a relatively simple task. All one needs is the appropriate transparency film for either a photocopy or infrared copy machine and a good master. The

difficult problem is the locating or constructing of a good pedagogically useful master. The present master book provides a large number of potentially effective masters and a teacher can easily and economically produce as many transparencies as desired.

The Transparency Master Book for Statistics was developed by five members of the AVIM Committee, M. Cardenas, R. Carison, E. Faulkner, H. Posten and L. Sherr and includes masters for the following areas:

1. Probability; 2. Data; 3. Random Variables; 4. Binomial Random Variables; 5. Normal Random Variables; 6. Sampling; 7. Estimation; 8. Tests of Hypotheses; 8. Miscellaneous.

This master book will be useful to many teachers of statistics, including elementary and secondary teachers. But its most important use will be in the beginning college service course for nonstatistics majors. In this course, teachers need all the help they can get. Ordinarily, students come to this course with extremely limited background in statistics and in science in general and, as a consequence, they are usually totally lacking in "pegs" on which to hang new ideas. These "pegs" are necessary to a teacher and must first be constructed if they are absent. Graphical presentation can help to construct these "pegs". The use of transparencies, or alternatively corresponding handout material, can help a student to better understand some of our more difficult concepts. For the same reason, this master book could also be useful in the beginning mathematical statistics course for statistics and mathematics majors. In many cases, new statistical ideas are just about as strange to students with mathematical background as without. The master book might also be useful to students in university departments concerned with the training of teachers of mathematics at the secondary level, particularly those departments becoming more concerned with the teaching of statistics in the secondary program. Students in such a program might possibly wish to have their own copy of the Transparency Master Book for future use in the preparation of transparency and handout materials.

Our primary recommendation for the use of the Transparency Master Book is not for a specific course but that it be used creatively and not statically. A major advantage of masters over preproduced commercial transparencies is that they can be readily modified before production of the final transparency. Commercial transparencies are often extremely good looking but not readily adaptable to the individual needs of a teacher. They are also usually expensive. Masters, however, can be modified by use of white-out correction fluid and a photocopy machine. A new master can be created by then typing in any desired changes in titles,terms or notation. An orator ball on an IBM selectric typewriter has large type useful for this purpose. Alternatively, these changes can be put in carefully by hand, or large adhesive letters designed for this purpose can be used. These masters can and should be modified to suit an individual teacher's needs.

After a transparency is produced from a master, it can be considerably enhanced by the use of colored transparency pens. A transparency made from a master will ordinarily be black on clear. The result can be a dull

projection and, with any detail, can lack emphasis. Black lines can be brought out sharply by going over them with a bright color. Underlining can be used to bring out important items, or material to be emphasized can be enclosed in a colored box. The latter can be particularly effective if not overused. Such use of color can considerably improve a simple black-on-clear transparency. In some cases, a user may wish to use a master to produce a multiple overlay transparency. This can be done by photocopying a master two or more times and on each copy whiting out different elements. (If infrared production is to then be used it is necessary that these photocopies be photocopied again since, otherwise, material under white-out will show through.) Transparencies made from the separate copies can then be overlayed.

It would be useful to readers to view some of these transparency masters. However, limitations on publication space for this paper does not allow the inclusion of the masters demonstrated at the conference. They, however, are basic masters for the introductory course and it will have to suffice to say that this Transparency Master Book appears to be the first of its kind for general use in the field of statistics and as such should be useful to many teachers. An enterprising teacher should be able to put the Transparency Master Book to effective use.