

PACE and STATLEV - Two Examples of Software Packages Developed with the Particular Purpose of Teaching Introductory Business Statistics

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1. Introduction

We first met at a seminar on teaching introductory business statistics at the Aarhus Business School, Denmark, in 1984. It soon became clear that we shared the same views on a number of matters critical to the teaching of our subjects. In particular, we were not happy with the standard business statistics course as promoted by many American texts, we were willing to admit that statistics can be very unpopular with students and misunderstood and under-utilised by colleagues teaching other subjects, and we recognised that if computers were to be used in teaching business statistics they must be introduced in a way where students concentrate on learning statistics rather than computing.

We have both been involved in the formulation of syllabuses tailored specifically for the types of courses and students at our respective business schools and have written extensive accompanying material and texts. And both of us have overseen the development of statistical computer packages for use in our courses. In developing these packages, a basic criterion has been to produce software covering all the statistical functions in the syllabus but requiring no special computing or programming skills. The aim has been to ensure that students can get on and off the computer as quickly and painlessly as possible while still appreciating the power of computers. Most commercial packages available ten years ago required teachers and students to spend excessive time on computing, with consequent loss of valuable time for understanding statistics. The packages were certainly not suitable for the courses in introductory

statistics or quantitative methods which all business students have to study; for advanced statistics and research they were excellent. The situation has hardly changed.

Writing our own software has been far from an easy and rewarding task. Numerous problems in data handling, in input and output design, and in writing adequate documentation have been encountered. This paper presents our views on the use of computer packages in teaching business statistics and discusses some of our experiences, problems, and successes in developing our software.

2. Computers in business statistics

Today, when an electronic calculator is almost as important as pen and paper, a course in business statistics without computers ought to be unthinkable. Students need to be familiar with statistical computing as, in the future, the bulk of statistical calculations will be performed by computer, and employers will expect competence in statistical computing. But, more importantly, computers can significantly improve the teaching and understanding of statistics and increase motivation of students since larger and more realistic data sets can be analysed, statistical concepts can be illustrated in class, and students have a convenient tool for completing or checking assignment work.

But some warnings have to be given. Clearly the students must have adequate computing facilities, the software used must be appropriate for a course, care must be taken not to turn a course in statistics into one in computing, and it is important not to let the software determine what statistical concepts are taught.

Personal computers are to be recommended since students and staff can be independent of mainframe computing facilities and can use the software on PCs at home or at work. More and more students will buy their own PC and will be further motivated to do so if reasonably priced statistical software is made available.

3. Selecting statistical software

There is no single answer to the question of which statistical package to choose since it depends on so many factors: the type of course, the capabilities of the students, the computing facilities available, and, most importantly, the desired syllabus.

The standard introductory business statistics course text is not necessarily appropriate. Account should be taken of the specific needs of your students, the courses they are studying, and their eventual employers, perhaps devising a quite radical syllabus and developing your own course material, and continually reviewing and revising the course content; this is not an easy step to take, given the convenience of working from a readily available text with accompanying workbooks and support material.

For your particular course, describe the desired computing functions, both for illustrative purposes and for "real life" analysis. The computer package you currently use may not be adequate and it may be time to change. Information on existing software is available from several sources including journals such as *Applied Statistics*, directories, and computer periodicals. Booklets on specific software, such as MINITAB and SPSS, are available and some texts have handbooks for these. If you cannot find adequate software, you can either choose the best one available and supplement it with

