

Teaching SAS in Business School – A Case Study

Teresa Ling, Albers School, Seattle University, Seattle WA
Mary Rivers, Albers School, Seattle University, Seattle WA

INTRODUCTION

In this paper, we present our experiences with using SAS as a standard package for teaching statistics in the Albers School of Business and Economics at Seattle University. The paper discusses the rationale for selecting SAS, the difficulties we encountered in the classroom, and how we addressed the problems that the teaching staff as well the students encountered in using SAS.

An Introduction to Business Statistics has been a required course in the Albers School, since the inception of the business program more than fifty years ago. For several years in the 1980's, MINITAB was the required statistical package. In 1993 the business curriculum was revised and a second quantitative methods course was added. The content of this second course focused on the general linear regression model and analysis of variance. At this time, a review of the standard statistical package was also undertaken.

MINITAB had gone through a number of revisions since we had adopted it as the standard. While there was still a version that did not require a hard drive, the newer versions were Windows based and did require a hard drive. We could not assume that each one of our undergraduate students necessarily had access to his/her own computer at home, and they could not place programs on the hard drive in Seattle University's computer labs. The possibility of continuing to use Minitab as the standard statistical package in the school was limited.

In choosing a new standard computer package, we considered the computational routines that we would be teaching, the cost of the program, and the use of the program in the business community. At the time SAS met all of these criteria. It had routines for all the techniques in statistics and management science that we were teaching in the new course. SAS offered a special license for the UNIX platform that made it relatively cheap to serve to as many stations as we wanted. Businesses in many areas, especially the aircraft industry and health care, were looking for graduates with SAS skills. Other programs

considered did not meet all three of the requirements. So in the fall quarter of 1995, all sections of statistics courses in the Albers School started using SAS as the standard package.

PROBLEM ENCOUNTERED

During the first year that we used SAS in our business school, we encountered some problems. One of the biggest problems was finding lab assistants who had a good command of SAS and statistics and who could help the business students to use SAS for their assignments. When we did find knowledgeable assistants, the turnover rate was high. This resulted in long lines of frustrated students waiting in front of professors' offices.

Another problem that we faced was the limited availability of satisfactory textbooks with SAS outputs. In addition, references that teach students on a step by step basis how to run SAS on the UNIX platform were limited. Students needed a reference that not only would teach them how to write SAS programs but would teach them also how to use the Seattle University UNIX environment.

At the Seattle University setting, most of the students have to work with the SAS program on campus. This is a problem for many. This is the biggest problem among the MBA students using SAS. Most of our MBA students are working full time, and it is difficult for them to have to come on campus to complete their SAS assignments. It creates additional problems when the classes using SAS are conducted outside of the central campus.

SOLUTIONS ATTEMPTED

The problem of finding appropriate lab assistants eased a bit after SAS ran for several quarters. We started hiring students who had previously gone through the statistics courses as lab assistants. Fortunately, all students in the business school have to take the statistics courses. Thus, we started having a plentiful supply of previous students who could help the current students learn SAS.

In terms of finding a step by step SAS guide for students, we have chosen Elliott's *Learning SAS in the Computer Lab* (1). Later using the SAS SelecText service, we put together one SelecText for each of our statistics courses (2), (3). Each of these custom-made SelecText contains pages from the official SAS user guides on the specific procedures covered in the course. This way we were able to provide students with an inexpensive official reference on SAS. In addition, students became familiar with the skills needed to use users' guides to develop their programming abilities. However, the students generally felt that the information in their SelecText was too overwhelming. They still complained that they did not have enough examples. The students had very limited experience with the UNIX platform, and many of their problems were UNIX specific. The official SAS User Guides that we used at Seattle University did not address these problems. In the summer of 1997, the authors obtained a grant from the Albers School to write a custom-made manual that would address our students' specific needs. In the custom guide, the various procedure statements were demonstrated through examples. Feedback on the custom guides from students has been very positive.

Frequent SAS problems include moving among the editor, the output, and log windows. Doing file transfers is another area of concern. We have found that the easiest way to learn is by demonstration and hands on experience. Thus, at the beginning of each quarter, we have held two three-hour workshops for this purpose. Normally, after one workshop, more than half of the students have some idea about the basic procedures in SAS and the file transfers. SAS is no longer a mystery. For those students who cannot make it to the workshop, or those who still have problems, they are encouraged to meet with the instructor for a one-on-one tutorial session. During the lectures, new procedures are introduced through demonstrations in classroom. During all these demonstrations, we always emphasize the meaning of the commands in the data steps and the procedure statements so that the students can understand what they are doing in each programming step.

In an effort to show the students how the SAS package can help them make real business decisions, we assign students case studies in business. In doing these cases, students learn to appreciate the ease in solving the problem that the SAS package affords them, and they develop a better understanding of the SAS output. The anxiety in students about SAS actually decreases after the first case study.

To solve the problem of having to come to campus to work on their SAS assignments, the MBA statistics class has switched to using the SAS Institute's JMP. Students can obtain their own copies of the software, and work at their homes or at their offices. This seems to have solved the MBA students' complaint about having to use SAS on campus. However, many students are more familiar with EXCEL, and from time to time we are still being asked why not use EXCEL instead of SAS in our statistical applications. We find ourselves explaining in some detail that EXCEL is a spreadsheet not a statistical package and detailing its limitations in processing statistical routines. The undergraduate students still use SAS program under UNIX on campus

WHAT LIES AHEAD?

Because more people are familiar with EXCEL than with SAS, some of the other courses in the Albers School require students to use EXCEL as the tool for analysis. There is a growing demand for training the business students in using EXCEL for simple statistical analysis. In this last academic year, we have made concession by using EXCEL in the first statistics course. The second course still requires the students to use SAS. We feel that for most of the analyses, regression analysis in particular, SAS is much more suitable than EXCEL. We also observed that more and more organizations are adopting SAS. SAS seems to be the way to go in business. We believe by adopting SAS as our standard package in statistics courses, we are not only increasing student exposure to more software packages, but in fact we are giving them a very much sought after skill. This in turn will increase the students' marketability. We are confident that our choice of SAS is correct, and we are looking forward to your suggestions and support.

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Authors Information

Teresa Ling obtained her BA at Seattle University and her PhD at UC Berkeley. She had been teaching quantitative methods in Hong Kong for 11 years before coming back to the Pacific Northwest in 1995

Mary Rivers obtained her BA and PhD at University of Pittsburgh. She has been teaching at Seattle University for 20 years.

Teresa Ling / Mary Rivers
Department of Economics & Finance
Albers School of Business & Economics
Seattle University
900 Broadway
Seattle, WA 98122
Email address: tling@seattleu.edu
rivers @seattleu.edu