Computer Skills for Actuarial Students
A Local Market Study

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Introduction. Since 1991 I have been placing actuarial students in jobs in the greater Phoenix area. During the last two years computer skills have appeared to become a more important part of the hiring process. For example, a student who had passed three actuarial exams lost a position to a student with superior computer skills but only one exam. This was not a complete surprise to me. My consulting experience was in real estate and mortgage-backed securities (not in actuarial work), and in those areas new hires were often required to have strong spreadsheet skills. I suspected that a similar situation had developed in my local market for actuarial students. This paper contains the results of a survey which show that my suspicions were justified.

The Survey. I personally interviewed 19 actuaries working at 16 firms in Phoenix. All interviews were conducted by phone, and all included the same three basic questions.

1) What software do you use in your own work?
2) What computer skills do you look for in new hires?
3) If you could choose between a job applicant with three exams and limited computer skills and another with strong computer skills and only one exam, which would you hire?

The table below shows the types of firms represented in our study.

	Individuals	Number of Firms
Consulting Firms	5	4
Life Companies	3	3
Health	5	3
Pension	3	3
Casualty	3	3

Survey Results.

What software was used by the actuaries who were interviewed? All of the firms interviewed made heavy use of spreadsheets. Most of the respondents used word processors for their own reports, and a significant minority used database programs on a personal computer (PC). Some respondents needed to use a query

language to extract database files from a mainframe for use on a PC. The table below shows the responses. It is worth noting that some of the respondents used both Lotus and Excel for spreadsheets. (Out of 19 respondents, 8 used Lotus and 16 Excel).

	Used Daily	Frequent Use
Lotus	8	
Excel	16	
WordPerfect	3	1
AmiPro		1
Word	6	6
PC Database		7
Query Language	3	
PowerPoint		3
SPSS, SAS		3
FORTRAN		2
Visual BASIC		1

What computer skills did these employers want in new hires? The majority of actuaries interviewed would either require or strongly recommend skill in *some* spreadsheet for a new hire. I have referred to this as generic spreadsheet skill. Two wanted a broader range of general PC skills and two had specialized database needs. Only one had no computer skill requirements at all. It is worth noting that no employer was looking for skill in a programming language such as FORTRAN or CI. The numerical results are in the table below.

	Recommend	Require
Generic Spreadsheet	8	6
Excel & Access	1	
A PC Database	1	
General PC skills	2	

How would prospective employers choose between an applicant with three exams and limited computer skills and another with one exam and extensive computer skills? An overwhelming majority of the actuaries interviewed chose the student with extensive computer skills, as indicated in the table below. (Two actuaries felt the question was too general, and did not respond.)

Limited computer skill & 3 exams.	0
Extensive computer skills & 1 exam.	15
Must look at individual to choose	2

Conclusions

This survey covered only the greater Phoenix metropolitan area. Other surveys would be necessary to see if attitudes are similar in other regions. We have come to the following conclusions for our own program in Phoenix.

I) In our local market, generic spreadsheet skills are extremely helpful in finding a beginning actuarial position. Database skills and additional general PC knowledge are also very useful. It is important for our students to develop such skills.

II) We already give spreadsheet modeling projects in our actuarial science classes. In the future we will emphasize these more and attempt to include some database work as well. (Many other actuarial schools do this. An article on "Using Spreadsheets to Teach Actuarial Science" (by Virginia Young of the University of Wisconsin-Madison) appeared in the July 1996 edition of *Expanding Horizons* , the newsletter of the Education and Research Section of the Society of Actuaries.)

III) We will ask our computer science department to investigate the possibility of creating a course dealing with power uses of an entire integrated package such as the Microsoft Office.

Problems

It is not a simple task to change a curriculum. Our actuarial courses are offered in a department of mathematics. Mathematics professors in universities are generally not spreadsheet users, and mathematics department computer requirements typically call for a course in a traditional programming language. More modern classroom applications typically involve packages such as *Mathematica* or *Maple* -which are quite powerful but not widely used by our local employers. It will take some time to move program requirements in mathematics departments to a point where students regularly see classroom applications of the computer skills that employers want.

There is a further problem caused by the actuarial examinations themselves. The examination system does not require or allow use of modern computer technology or advanced calculators. Students tend to think of examinations as the sure path to future actuarial jobs (despite the fact that this survey contains indications to the contrary.) Some of my students have resisted spending time on computer projects because they believe that they can pass more exams if they do not spend time on developing computer skills. This attitude is not unique to my students at Arizona State University. It is expressed quite clearly in another article in the July 1996 *Expanding Horizons*. The article "Integration of Computers and the Use of Group Projects in the Actuarial Classroom" was written by two

actuarial students who were students in a class which required a wide range of computer projects. The students, John Binder and Neal Dihora, state clearly that "We believe that the actuarial exams do hamper the student's willingness to learn computer skills that could be useful on the job. Everyone has finite time, and human nature is to do what you perceive is going to help you the most. I think most students will agree that having an extra exam is a more attractive option than spending that time learning Excel, Minitab or another packages(sic)." For my students, the attitude expressed in that quote is wrong. This may not be true for students in other regions. As always, further studies are needed to see what the situation is in other regions.