



SOCIETY OF ACTUARIES

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Australians make changes in actuarial education

by David Knox and Richard Lyon

As the Society of Actuaries begins its redesign of its E&E system, it may be useful to look at the Institute of Actuaries of Australia's actuarial education changes that they believe are necessary to prepare for the 21st century.

Actuarial education in the English-speaking world has been remarkably similar. Historically, it has included two major areas of study:

- 1) Mathematically based subjects such as probability and statistics, compound interest, and life contingencies
- 2) Practically based "professional" subjects such as life insurance, pensions, investment, and non-life insurance

Relatively minor changes exist among the early subjects and in the application of actuarial principles in various practice areas for Fellowship qualifications in North America, Australia, and the United Kingdom.

The broader application of actuarial principles

There also are other similarities as each actuarial organization pursues the idea that actuaries can work in a much broader field. In particular, finance is often cited as a potential area in need of actuarial expertise. However, the potential for actuarial involvement and input is, in fact, much broader. This could include areas as diverse as long-term agricultural planning, weather forecasting, casino management, and the cost-benefit analysis of any long-term government program.

Of course, it is impossible for any educational syllabus to cover all potential subjects. In addition, the rate of change is such that specialized courses required regular updates. What is the solution for providing a comprehensive and broad actuarial education while acknowledging increasing specialization?

In a 1994 paper, "Actuarial Education for the Next Century," the Education Management Committee of The Institute of Actuaries of Australia stated that actuarial skills could divide into two sets:

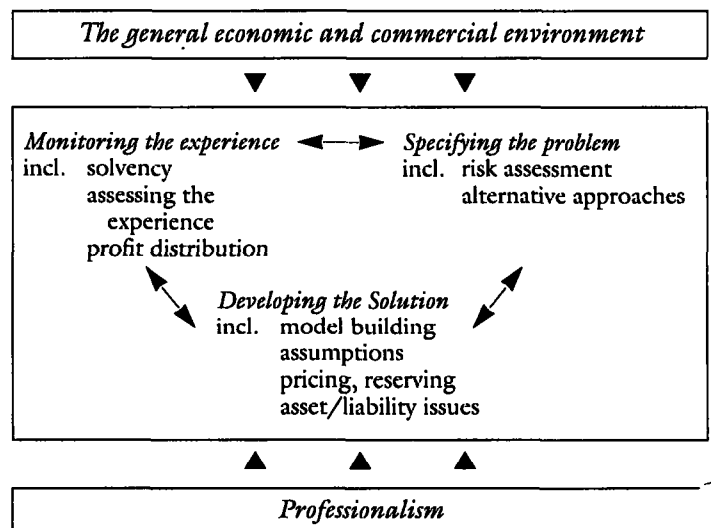
- 1) General skills that enable actuaries to adopt a scientific approach to problems
- 2) Specialist skills that take these general skills and apply them to areas where actuaries have particular expertise

It went on to suggest that general skills need to be mastered by all actuaries, whatever their specialty. General actuarial skills are illustrated in the actuarial control cycle in Figure 1.

The role of the control cycle subject

The actuarial control cycle presents a holistic approach to actuarial work without requiring the student to focus on one or two particular areas of practice. As such, this subject provides students with several important advantages:

Figure 1: The Actuarial Control Cycle



- Furnishes an actuarial framework for later subjects
- Concentrates on principles, approaches, and problem-solving without unnecessary attention to legislation and other details that are covered in later subjects
- Builds upon the mathematically based skills taught in the earlier subjects
- Applies the cycle to a wide range of problems, thereby highlighting the opportunity for actuarial expertise to be applied in the wider field
- Supplies a broad and flexible syllabus that can be easily updated with contemporary examples
- Provides for improved job opportunities as students will have better problem-solving and analytical skills in both the traditional and wider areas

As a result of this change, the Fellowship qualification for The Institute of Actuaries of Australia will now require students to pass the following three parts:

Part I: The mathematically based subjects (consistent with the UK Institute and Faculty)

Subject A: Fundamentals of Actuarial Mathematics

Subject B: Economics and Finance

Subject C: Statistics for Insurance

Subject D: Actuarial Mathematics

Part II: The Actuarial Control Cycle (1 subject)

Part III: Specialization Options

Students must pass an examination in two of the following five areas:

- Subject 1: Finance
- Subject 2: Investment Management
- Subject 3: Life Insurance
- Subject 4: Non-life Insurance
(i.e., property and casualty)
- Subject 5: Pensions

Each subject in Parts I, II, and III will require at least six hours of examination.

The aim of the control cycle subject

The aim of the actuarial control cycle subject is to provide the student with the generalized actuarial approach necessary for tackling a range of commercial problems, including those associated with risk-based products and others offered by financial institutions. The subject is not specific to any single area of practice but draws examples and implications from many areas of work. This includes investments, finance, life insurance, general insurance, and superannuation, as well as non-traditional areas of actuarial endeavor.

Conclusion

We believe the actuarial control cycle is consistent with underlying actuarial principles that have applied to many practice areas for a long time, perhaps without recognition. As each area becomes more specialized, it is important to recognize and to teach the basic core of the actuarial approach (as typified by the control cycle) within all actuarial

education programs. In addition, the actuarial control cycle subject will ensure all future Australian actuaries have a common core of actuarial science that goes beyond existing mathematical subjects. Finally, it is not specific to a particular practice area and has applications beyond traditional actuarial work.

We believe the new Australian actuarial education system is preparing the profession for the 21st century, as it:

- Covers the basic concepts underlying all actuarial science within the mathematical subject
- Has a compulsory course (the actuarial control cycle) that illustrates how these concepts combine the building of mathematical and statistical models to solve practical problems in a range of areas
- Will enable students to specialize in two areas built upon the foundations of the control cycle, establishing commonality and unity within the profession

In summary, we believe this education system will better prepare actuaries to meet the challenges of the 21st century that will involve a blurring of various disciplines and practice areas.

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SOA awards 1995-96 Ph.D. grants

Six Ph.D. candidates will each receive a \$10,000 Society of Actuaries' Ph.D. grant for the 1995-96 academic year. Five grants are new, and one grant is renewed for this academic year.

The grant recipients are:

- Hélène Cossette and Etienne Marceau
Université Catholique de Louvain
- Soo Hak Hong
University of Nebraska-Lincoln
- Mary Virginia Kelly
University of British Columbia
- Ken Seng Tan, ASA
University of Waterloo
(Funded by the Investment Section)

- Frédéric N. Michaud, ASA
Université of Lausanne in Switzerland
(Grant renewed for a second year)

Individuals admitted to Ph.D. candidacy by their institutions and whose thesis topics are actuarial science or a related area are eligible for the grant. Upon evidence of satisfactory progress, the grant may be renewed up to three times.

The Society of Actuaries (SOA) gives preference to students who are SOA members or who are working toward becoming SOA members.

The application deadline for the 1996-97 academic year is March 15, 1996, and applicant materials will be available in early 1996 from the SOA Research department.