Session A5

Statistics Teaching in Non-Mathematics Courses

Organiser: Andy Begg (Hamilton, New Zealand)

Invited Speakers: Bill Barton (Wellington, New Zealand)
Carol Butel (Christchurch, New Zealand)
Abdelmegid Farrag (Cairo, Egypt)
Alan Rogerson (Melbourne, Australia)
Mary Rouncefield (Chester, England) and Phil Taylor (Sheffield, England)
Leigh Wood (Sydney, Australia)

Abstracts: Cleve Barlow (Auckland, New Zealand)
Wiremu Solomon (Auckland, New Zealand)

Introduction

Many students are introduced to statistics in subject areas other than mathematics. Others first learn statistics as part of mathematics but find it hard to apply their learning in the contexts of other subjects. A third group learns statistics in mathematics and in other subjects but seems to keep these sets of ideas in separate compartments.

The aim of the papers in this session is not only to look at statistics in other courses but to discuss some of the underlying questions that arise and to consider different strategies for coping with the situation. The fundamental question is how do students learn, and from this question we have a number of other questions.

Should statistics be taught in a problem-solving way? Should it be taught in context first then generalised or the other way around? Will teaching in context be the best way to help children construct and refine their ideas about statistics? How do teachers ensure that context-first approaches will lead students to construct an integrated rather than a compartmentalised view of the subject?

Statistical literacy is needed for full participation in society and in further education in many subjects so the question of whether the statistical component of school mathematics should be taught as "queen or servant" arises. Associated with this is the question of who should teach it - should the basic statistical principles be taught in mathematics courses by specialists or be taught as a service subject by other teachers/ users in context when and where it is needed? If all teachers are to be teachers of

statistics, can we be sure that students are getting the same message from the different sources and that modern (EDA) approaches are being taught?

The seven papers in this session address some of these issues. Carol Butel's paper "Statistics in Non-mathematics Courses" shows some of the opportunities in primary schools for integrated teaching where statistics (and other mathematics) can easily be taught within other subjects because one teacher has responsibility for all the areas of the curriculum.

Mary Rouncefield and Phil Taylor's paper "Statistics and Mechanics" illustrates some connections between a subject, in this case mechanics, and high school statistics. Other subjects such as geography or economics could have been chosen and would have shown similar links.

Abdelmegid Farrag develops some of these ideas from the point of view of students moving on to tertiary education and the statistical needs they will have regardless of their mathematical background.

Alan Rogerson's paper "Integrated Real Life Themes and the Teaching of Probability and Statistics at 11-16 Level" shows how integrated themes can be used in a secondary school programme.

Mary Rouncefield's second paper "From Cooperation to Coordination" suggests another way in which cooperation and coordination between the various people involved in teaching statistics can be facilitated. The role of a statistics coordinator is explored and this idea could be extended so that statistics coordination was part of mathematics coordination across all subjects.

Bill Barton, in "Statistics for Bilingual Students in NZ Secondary Schools" shows how statistics can be an empowering tool for a cultural minority and how the context of other subjects can be brought into the lesson so that children will engage. The abstracts by Cleve Barlow and Wiremu Solomon treat a quite different aspect of this theme. In a different context again, Leigh Wood discusses some of the problems of teaching statistics within a multicultural society (Australia) where the minority groups are mainly new immigrants.

Our students' experience of statistics is likely to continue to be from a number of sources, our challenge as educators is to ensure that the quality of their statistical education is enhanced rather than hindered by these cross-curriculum links.