

1999 Presidential Address - SASA Annual Conference

I have a confession to make! When I was first asked if I would be prepared to stand as President of the South African Statistical Association my immediate reaction was to think quietly to myself “What on earth will I say at the Presidential Address?” Having now been President for a year I realise that there is so much I would like to say, and possibly ought to say, that it is difficult to know where to begin. I will therefore focus on only one thought, one that could be construed as being obvious, one that might be interpreted as coming from an ivory tower, but one which I nevertheless feel is very important to all of us. The message concerns a problem that Statisticians, and Statisticians in South Africa in particular, are currently facing and I will consider the problem in three parts: - A Demand, A Supply and A Feedback Loop.

First The Demand! I personally am constantly amazed and delighted at how vibrant and alive Statistics is today. We are following on the breaking wave of computing and are enjoying attention and recognition! There are many areas of application in Statistics that have stimulated the discipline immeasurably in recent years, not least of these being Financial Statistics, Medical Statistics and image processing. The number of jobs available and the associated recognition given to Statisticians in these areas is testimony to this! The days when we were tempted with an acknowledgement at the end of an academic paper or with a small consulting fee to help with a thorny statistical issue are gone and we have become very much a part of “the team”. With all of this has come a wonderful synergy between challenging data sets provided by the practitioner and new and innovative ways of handling them provided by the Statistician. All this excitement in Statistics has of course necessarily created a demand for people trained in Statistics.

Now for The Supply! There are very broadly two groups of people for whom a training in Statistics is essential. Firstly there are those whose interests are firmly rooted in other areas, such as Accounting or Zoology, but who nevertheless need to understand something of Statistics and who, more crucially, need to be able to pose the right questions to the Statisticians. Are we doing enough to train such people? This is well-trodden ground, with educators striving to make subtle concepts in Statistics user-friendly, with the writing of many refreshingly stimulating and informative textbooks and with the support and inspiration of researchers in Statistics in Education such as David Moore. Secondly there are those students who are to be trained as fully-fledged and dedicated Statisticians, the people who field all the questions and who model the data innovatively. Perhaps, until recently, there has not been an overwhelming demand for such people and we have cheerfully accepted that Statistics as a discipline interests a select subset of the mathematically able and that the numbers of Statisticians so trained suffices. This is no longer true and we are certainly having to think proactively about drawing more students into our discipline, first because it is vibrant and exciting and second because there is so clearly a demand. We need to attract students into Statistics in their first or second year of tertiary education by interesting them and by offering them bursaries. We also need to capture suitably talented students at Honours and at Masters level to convert into Statisticians! Masters degrees in Statistics by coursework and mini-dissertation are common in the U.S.A., in the U.K. and elsewhere and it is reassuring to

see such courses developing in South Africa and focusing for example on Biostatistics and on Risk . All of this is challenging and interesting. We know the sort of people that we need to produce, we know about the supply to meet the demand, so where is the problem?

The problem lies in a Feedback Loop! In order to provide good Statisticians we need good educators, people who know and love their subject and who are also able to transmit their enthusiasm to their students. They emerge from the following feedback loop:-

[Diagram here]

The immediate question we have to ask ourselves is whether we have enough such educators and, sadly, I think that the immediate answer is no! Why are Statisticians not joining academia and, worse, why are many of those in education leaving? I can offer at least some reasons; I am sure there are many more.

1. The Attraction of other jobs

We have to be blunt and admit that salaries in tertiary education are not competitive with those in commerce and industry and further to acknowledge that this is particularly true of Statistics. Coupled with this is the fact that a young person coming into academia has to work very hard at teaching and at research in order to succeed and that the rewards come slowly. There is however another and in a sense a more insidious problem! Educators in tertiary institutions have always had the scope and the time to do research; this is no longer their sole prerogative. People employed in the private sector find opportunity to develop individually, to think creatively and to do research. This is particularly true of Statisticians who may well find themselves researching small companies for asset managers, investigating an appropriate drug dosage for a pharmaceutical company or smoothing images from the Hubble telescope.

2. The Attraction of Overseas

There is a brain drain from South Africa and we should ask ourselves what makes being overseas attractive to Statisticians, and to young Statisticians in particular. The answer I think is in the critical mass of Statisticians overseas, colleagues with whom one can discuss the finer points of mixed models and Markov chain Monte Carlo, from whom one can get a clear idea of cutting-edge ideas and with whom one can share a challenging applied problem. This happens in South Africa but on a very much smaller scale.

3. A dangerous downward spiral!

I venture to suggest, and I fear, that we are entering a dangerous, downward spiral in education in Statistics, that of "more work - fewer people - more work - fewer people....". This severely exacerbates the problems I have already discussed.

How are we to address these issues? One can think of some obvious, albeit partial solutions.

1. The Attractions of Academia

The salary issue for educators can to some extent be resolved if tertiary institutions can be persuaded that Statisticians are a rare breed in great demand. Salaries can be subvented with the help of outside bodies and promotion prospects improved. In addition the tertiary institutions should perhaps advertise the delights of an academic job a little more! There is nothing more satisfying than a course well-taught, a research problem solved or statistical advice gratefully received. In addition Statisticians have the opportunity more than many other disciplines to work in complementary areas which interest them such as Medicine, Zoology, Psychology or Finance.

2. The problem of Overseas!

Perhaps we can to some extent turn this around to our advantage! In particular many young people leave the country to study abroad with plans to return after 5 years, but sadly they do not come back. Perhaps we should rather encourage our bright young Statisticians to study here in South Africa and to weave into their studies a year overseas in an appropriate environment. We have wonderful data in abundance in South Africa, our colleagues overseas are fascinated and there is much to be gained from joint collaborations. A Brazilian Statistician, Clarice Demetrio, has achieved this by carefully placing young colleagues with eminent researchers overseas for a year. Her fledgling lecturers are flourishing and Applied Statistics in Brazil is also flourishing.

3. The dangerous, downward spiral

The answer to the downward spiral is, in essence, a concerted effort from us all to assist in producing more trained Statisticians and to build on the capacity that we have as quickly as possible.

I fear however that I have omitted something from the feedback loop. It takes four years to train an Honours graduate, a further one to two years for an M.Sc and another three to four for a Ph.D. The demand is running away from the supply, there is no quick-fix and we are therefore in danger of failing to have good Statisticians to teach good Statisticians! I would therefore urge you to think of creative ways in which we can firstly sustain the group of Statisticians already working in Education and secondly build up a bank of educators to cater for the current and future needs. I see solutions to the problem of the feedback loop but I sense a huge concern that a vibrant discipline has generated a demand for qualified people but that the demand will not be met or, at least, will not be met sufficiently quickly.