

THE PROFESSIONAL STATISTICIAN: A POLICY FOR CONTINUING PROFESSIONAL DEVELOPMENT

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We live in changing times! The 21st century is fast becoming an age of assessment, of quality assurance – and of accountability. What does this all mean for the professional statistician? It means that potential clients need assurance of "professional competence". It also requires that this "professional competence", once achieved, is maintained in the light of advancements in both technical and analytical tools. This paper will illustrate the philosophical underpinning of the CPD process which will be implemented and used by the Royal Statistical Society as a vehicle to ensure the maintenance of professional standards within the statistical profession, in support of its professional status award of Chartered Statistician (CStat.). The paper will also seek to initiate and encourage a continuing rational debate between Academic Statisticians (who are increasingly being encouraged to generate commercial revenue for their universities) and practising commercial statisticians (who are increasingly finding academic developments in statistics irrelevant for their current needs).

INTRODUCTION

I am very privileged to have been a professional statistician for 35 years of my life. The breadth of topics I have studied, the people I have met and the countries I have visited have challenged me intellectually, but have immensely enriched and broadened my social, political and scientific awareness. And I hope I have made a contribution. But do you know, I don't think I have ever seriously thought about my professional competence. That was simply part of the moral obligation I owed to my clients and to my colleagues.

But I guess we move on – and we live in changing times. This new millennium is a litigious age – an age of assessment, of quality assurance and of accountability. And in this litigious age, ironically, the role of the statistician has suddenly become critical.

The public now feels better informed and more quickly so than at any time in history. The increasing influence of the media and the development of the web have resulted in an overload of information on topics of potentially great importance for us all. (Notice the deliberate use of the word *information* as opposed to *knowledge*.) Much of this information is numerical and much of it is related to risk. For example, we are asked to judge the evidence for the link between BSE and vCJD. The courts now routinely consider DNA evidence linking an accused person with crimes such as rape or murder. Parents are required to judge the safety of the MMR vaccine. These judgements require the processing of varying amounts of information of varying quality, and there are key roles for statisticians to turn this information into knowledge.

How do – how should – statisticians react when asked to appear as expert witnesses? The profession has long suffered the gibes of generations of people who believed they knew all about statistics and who could do better than us. So why should statisticians – confident in their own professional competence – agree to be cross-examined by lawyers, equally convinced of theirs? Or why should statisticians be accountable for the advice they offer to today's multinational corporations on the safety aspects of nuclear reprocessing or GM foodcrops?

So, there is the problem. What are the key issues? My shopping list is to ask:

- What does the world demand of its statisticians?
- Who are those statisticians?
- How do they support their competence?
- How do they maintain and develop their competence?
- What is the meaning of competence anyway?

WHAT IS A PROFESSIONAL STATISTICIAN?

A statistician to be effective needs technical competence – and charisma. A statistician with the second, but not the first, is analogous to a second hand car salesman, or a filmset – all front and no substance. A loss of credibility is only one stumble away! A statistician with the first, but not the second, conforms to the world's archetypal image of the ageing academic who can explain the intricacies of the theory supporting the problem without shedding any light on the key issues.

This of course raises interesting questions as to how the profession can transform individuals from both groups into really effective people. More fundamentally, it raises issues as to what it is which determines professional competence, how this can be evaluated and how it can be maintained.

The Royal Statistical Society (and before that the Institute of Statisticians) has long recognised the importance of promoting and underpinning the role of the statistician as a professional. It has championed the importance of the status of Chartered Statistician (C.Stat.) as a recognition of a level of basic technical competence coupled with a subsequent period of relevant, practical experience – an approach paralleled in many other professions. However, unlike a range of other professions, this chartered status is not required as a licence to practise. Indeed, it will take time before employers come to realise that there may be potential benefits from employing chartered statisticians. There is room for a debate here within the profession, but I will come to that later.

For now we can define a professional statistician as one with a degree level training in statistics which has a good foundation, coupled with acceptable levels of breadth, depth and quality, followed by four or five years of practical experience attested to and supported by knowledgeable referees. This, hopefully, is not a contentious definition, but it raises an important issue. My Masters degree was earned in 1967, so why am I fit to practise today – indeed, am I fit to practise today?

CONTINUING PROFESSIONAL DEVELOPMENT (CPD)

The phrase really needs to be read in reverse order! For a statistician to remain competent over a working career, it goes without saying that *development* is crucial – and this development has to be a more active process than simply one of osmosis. The development has to be targeted at the *professional* skills required for the current employment. Thus the nature of the relevant CPD will inevitably change over a statistician's career. We never stop learning and so this professional development must be part of a *continuing* process both to maintain existing skills and to enhance the range of skills over time.

Eraut, Morley and Cole, (1998) define the goals of CPD as

- career development where they make the important point that an employee with a relevant and current career portfolio is potentially more likely to retain employment in periods of downsizing or restructuring;
- improving and maintaining the quality of practice;
- expanding one's domain of competence;
- facilitating changes in practice;
- quality assurance for users and the public.

In developing a scheme for monitoring CPD it is important to identify what can be considered as relevant activities.

There is a widely held view – mistaken, I believe – that for a statistician CPD means Statistical CPD. I have to say that I have encountered this view more from the academic community than elsewhere! But I am not alone in believing that the issue is much broader. "Any relevant study that enhances your ability to practise architecture is valid CPD." (RIBA, 1999) "The professional associations view management and leadership as highly relevant. There is a challenge to suggest how development in such areas can be established as part of a professional association's specification for membership or CPD." (Perren, 2000) The British Computer Society encourages members to undertake CPD to "maximise your potential for lifetime employability".

The question of what actually constitutes CPD differs between professional bodies, but is broadly similar. Many organisations make a distinction between *formal* and *informal* activities. The list of activities set out by the Chartered Institute of Bankers is not atypical:

1. Further qualifications and/or distance learning.
2. Short courses, company in-house training and development courses.
3. Management development.
4. Imparting knowledge.
5. Conferences, exhibitions and seminars.
6. Meetings.
7. Committee work.
8. Private study.

The Royal Statistical Society is committed to the introduction of a formal CPD scheme linked to the award and maintenance of C.Stat. status, and is currently undertaking a study to inform the development of an appropriate scheme which can meet the highly variable needs of a very broad population of people. The key principles underlying such a scheme are threefold. It must be simple, because otherwise it will be too onerous for people to complete it efficiently and the resultant data will be of poor quality. Second, the scheme needs to be of wide applicability so that it is as relevant and appropriate to a British academic as it is to a Government statistician in Botswana, as it is to an agricultural statistician in Nepal, as it is to a medical statistician in the United States. Third, it is not the CPD itself which matters, it is the resulting quality of the practising statisticians who are doing the CPD. Thus it is important to use formal requirements as a carrot to encourage and not a stick to demand. For this reason the most effective systems are self assessment schemes.

A likely set of CPD categories might be development in the areas of

- learning statistics
- doing statistics
- managing statisticians
- personal development
- informal CPD

It is also important to remember that the key word in assessing levels of CPD activity is the word *development*. Has attendance at ICOTS6 really been a developmental occasion, or was it just a good excuse for a holiday in South Africa? It is for you to judge!

WHO NEEDS PROFESSIONAL STATUS?

How would you select a consultant surgeon to operate on you? How would you select a solicitor or an architect? Would you expect them to be professionally qualified? Would you hope that they are up to date with the latest information and technology? In the UK, members of these professions are required (effectively as a licence to practise) to maintain current CPD records.

So, how would you select a statistician? We all have our dossier of horror stories of inappropriately collected data, inappropriately analysed data (and sometimes both) being used to underpin key decision making. The more important the decision the more important it is to be able to trust the statisticians and to ensure their involvement at all stages of the process. Trusting the statistician may be rather easier to do if evidence is available to attest to that person's professional competence – both technical and interpersonal – and to know that they too are up to date.

I believe that all practising statisticians should be professionally qualified – but I fear I may be in the minority. I am certainly aware of a different perception in the UK between statisticians in universities and those in commerce and industry. This is a generalisation so I will immediately be attacked from colleagues in both camps who will tell me I am wrong. This may be because they are among the more enlightened!

Why should an academic need to be professionally qualified, because they *are* by definition? Why should a professionally qualified statistician working in industry need to do anything academic, because they have all the practical skills necessary to do their job effectively already? The Royal Institute of British Architects have an interesting CPD requirement of

"teaching for those who normally practice" and "practice for those who normally teach". I think I rest my case!

Twelve months ago a Select Committee of the House of Commons asked what proportion of statisticians in the Government Statistical Service was "professionally qualified". It is questions like this that provide a chink of light to start to promote the recognition of professional status within the statistical world as an important way forward. Then continuing professional development can be seen as a key part of maintaining that status.

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