

A NEW QUALIFICATION FOR STATISTICAL CLERKS IN NATIONAL STATISTICS OFFICES

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For many years the Royal Statistical Society has had an Ordinary Certificate in Statistics as a first qualification in statistics. In 2000 the three authors worked with colleagues from the National Statistical Office (NSO) in Malawi and from Chancellor College, University of Malawi, to develop a parallel course in Key Statistical Skills for clerks at the NSO. This course emphasizes the practical nature of statistics and develops skills in teamwork, communication and project work as well as including some extra statistical content in demographic and economic statistics. The first students took the courses in 2000/2001. The authors will report on the experience and the positive gains in tailoring courses for particular student needs.

BACKGROUND

In 1999 the Malawi National Statistical Office (NSO) developed a training programme that identified the need for training in key statistical skills and methods. To meet this need, the University of Malawi (Chancellor College) agreed that they would be interested in mounting an in-service training programme for statistical clerks employed at the NSO. The course would be supported by the UK Department for International Development (DFID), through their programme of support to the NSO. After discussions, they agreed that initially the course should follow the Royal Statistical Society (RSS) syllabus for its Ordinary Certificate (OC) and be externally examined by the RSS. The RSS Centre for Statistical Education were invited to assist in the development of the course. Two visits to Malawi were made; the first in June 2000 by Neville Davies, Director of the RSS Centre for Statistical Education (RSSCSE), and the second by Peter Holmes and Bradley Payne of the same institution. During the first visit, Neville Davies endorsed the approach and made recommendations concerning next steps. During the second visit, a course design and training session developed course materials, trained teaching staff, and agreed firm proposals concerning the structure of the course. In addition a new qualification was developed which encompassed specific key skills at an appropriate level for clerks in National Statistics Offices. (Further details regarding the initial investigation and the training delivered can be found in Davies, 2001). The new course ran in parallel to the teaching of the Ordinary Certificate from September 2000 to May 2001 at the Chancellor College in Malawi, with Peter Holmes as the external examiner for the RSS Certificate in Key Statistical Skills.

THE RSS ORDINARY CERTIFICATE AND THE DEVELOPMENT OF THE NEW QUALIFICATION

The RSS Ordinary certificate in Statistics is a widely available course by clerks throughout the world. It is pitched between GCSE and A-level qualifications of the UK, but concentrates very much on the practical aspects of data collection and simple analyses. The normal study time is typically one year with two written paper examinations. Addressing the need for key statistical skills.

As noted by the NSO of Malawi further general skills, namely *key skills* and subject specific material were needed by their clerks in addition to the knowledge gained from the RSS Ordinary Certificate. In brief, key skills are the general skills that can help the student improve their learning and performance. Not only are the skills useful for learning, but recognised as useful in everyday life. The six key skills are communication, problem solving, improving own learning and performance, working with others, information technology, and application of number. For further information on key skills and the levels please refer to Key Skills documentation produced by the Qualifications and Curriculum Authority (QCA) in England. (Information may be found at the site <http://www.qca.org.uk/nq/ks/>). To facilitate the delivery of the RSS Ordinary certificate and the development of the new qualification the authors worked closely with the proposed teaching team comprising of senior staff of the NSO and tutors from the

Chancellor University. The intention was that the teaching team would gain ownership of the course. Working together the general key skill material was modified. The new qualification addresses personal skills and key statistical skills.

PERSONAL SKILLS

The student will be:

- able to plan and manage his/her own learning and work;
- able to work in groups and independently;
- aware of the need for continuing professional development after completing the NSO OC programme and be motivated to do it.

KEY STATISTICAL SKILLS

The student will be:

- competent in the use of information technology, including spreadsheets, word-processing packages and electronic mail;
- able to use information retrieval skills to locate relevant information, including the use of the library, databases, and search engines;
- analytical in the formulation and solution of problems;
- able to gather, evaluate, analyse and present numerical and statistical information;
- present clear and logical arguments, and communicate information in writing and orally.

Furthermore the extra technical subject material required by the NSO clerks is in the areas of economics, demography and computing. Such topics are likely to be of relevance to other statistical offices and are detailed in the APPENDIX.

COURSE MANAGEMENT AND ASSESSMENT

A thorough course management strategy document was developed with the teaching team so that any foreseeable problems with the course content and management could be overcome. The document envisages the course being delivered over two 10 week periods, before and after Christmas, with a wide variety of teaching methods. A non-assessed group project is done in the first half of the course and each student does a personal project in the second half of the course.

Assessment of the new course is through four assignments spread throughout the year and by an individual project. The four assignments were designed to cover the extra technical content and the key skills aspects of the course, however it was noted that key skills may also be assessed in the context of any of the subject matter. A difficulty that arose, not unique to this particular course, is that typically only summative assessment techniques are employed. To enhance the teaching of the new qualification the course trainers were made aware of the principles and approaches of formative evaluations. For each key skill, assessment requirements were detailed together with guidance on how to assess. For example the working with others key skill was assessed with groups of students working together on datasets on education in Malawi. Their brief was to make recommendations to the Ministry of Education based on these figures. The key skills in information technology were assessed by a specially designed workshop using computers.

The personal project is regarded as an essential ingredient of the course giving an opportunity for individuals to obtain experience of (and to be assessed on) an in-depth study of statistical methods applied over a period of weeks to one specific area of practical enquiry. It provides a chance for individuals to follow through in detail all the stages of a statistical enquiry from the statement of its aims, the compilation (or collection) of relevant data, its pertinent presentation and analysis to a meaningful statement of its conclusions. The project consists of a single statistical enquiry; the topic being chosen by the student in consultation and discussion with the tutor. In this first year, all the students chose topics which were of immediate relevance to the economic and social structure of Malawi.

POSITIVE GAINS AND RECOMMENDATIONS

A total of 15 students took the course and were entered for both the RSS Ordinary Certificate and for the Certificate in Key Statistical Skills. One candidate obtained the Ordinary

Certificate, though there were also many near misses, which is in line with results obtained previously by groups entering for the Ordinary Certificate for the first time. Seven of the candidates were awarded the Certificate in Key Statistical Skills. The students displayed great enthusiasm and a strong commitment to the course. Their general statistical skills were enhanced with the new material and the project work together with the assessed material showed an appropriate range in quality. Continuing professional development was also shown as many of the students stated their wish to continue their studies in statistics.

The significant achievement in the development of the Malawi Certificate in Key Statistical Skills was in the accreditation by the Royal Statistical Society. This qualification is the first of its kind and much interest has already been indicated by other National Statistical Offices throughout the world to deliver the training programme. It was anticipated that many of the problems experienced could be overcome in subsequent course deliveries. The main recommendation to ensure the smooth delivery of both the RSS Ordinary certificate and the Certificate in Key Statistical skills was to follow closely the guidance outlined in the Course Management Strategy document. Relevant to both strands of the training programme it is stressed that the teaching team are able to deliver the material at an appropriate level and provide support where needed.

DISCUSSION

The development of the Certificate in Key Statistical Skills is recognised as a valuable course to be undertaken by statistical clerks in conjunction with the RSS Ordinary Certificate. A foreseeable problem with such a course especially in poor countries is in the funding needed to implement and ensure long-term viability. It is therefore important to select the best training team available to ensure the success of the course and wherever possible to offer the course to students other than statistical clerks at the NSO.

REFERENCES

Davies, N. (2001). CPD in Africa. *RSS News*, January 2001.

APPENDIX: EXTRA MATERIAL FOR THE MALAWI CERTIFICATE

Economics

- overview of main economic statistics concepts and sources of data: trade statistics, business surveys, income and employment, balance of payments
- main principles of national accounting: concept and simple calculation of value added
- concept and calculation of constant and current prices, and simple growth rates

Demography

- Sources of demographic data
- calculation of key measures of fertility and their interpretation (crude birth rate, general fertility rate, total fertility rate)
- calculation of key measures of mortality and their interpretation (crude death rate, age specific death rates including infant mortality rate and child mortality rate)
- population pyramids
- concept of migration (without computation)
- meaning of life expectancy (without computation)
- dependency ratio
- calculation of annual growth rates

Computing

- basic use of a computer (including filing system)
- use of a word processor
- spreadsheet skills: use of formula, sorting, filtering, elementary cross-tabulation
- use of spreadsheets and/or statistical analysis software for descriptive and statistical analysis of data
- use of spreadsheets and/or statistical analysis software to produce graphs and tables for presentation