

## STATISTICAL EDUCATION IN THE DEVELOPING COUNTRIES OF AFRICA: THE NIGERIAN EXPERIENCE

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This address will deal only with Statistical Education in post secondary institutions in Nigeria. Expositions on teaching statistics in schools in Africa have been given elsewhere.<sup>1, 5, 9</sup>

In Nigeria, statistics is now fairly well established in the universities. All the six older universities have statistics programmes leading at least to the first degree either in single or in combined honours (Statistics/Mathematics, Statistics/Education, Statistics/Economics, Statistics/Computer Science). The other seventeen newer universities have all included statistics in their mathematics, economics or education curricula. This is with a view to increasing the marketability of their graduates.

### What We Teach

The B.Sc Statistics programme of universities in Nigeria and indeed in most Anglophone countries of Africa are similar to the standard B.Sc programme of either the British, or the American Universities. The required levels of Mathematics and Economics are usually built into the programme.

A typical B.Sc Statistics programme would have courses built around topics like: Probability and Distribution Theory; Sources of Official Statistics, Sample Surveys, Experimental Designs, Inference, Methods (Non-parametric, Multivariate, Sequential) Special Topics (Demography, Actuarial Statistics, Econometrics, Operation Research) and Practical Project.

From the standpoint that statistics is not culture-invariant, two main criticisms have been levelled against this "standard" programme: firstly, it is said to be "imported" and secondly it is too theoretical. My answer to the first criticism is that there is nothing wrong with "importing" a programme. After all the entire educational system we now have has undergone a long chain of importations from one civilization to the other. What is important is the modification or adaptation of the imported material.

On the issue of adaptation, a course in sample survey in a Nigerian University would make case studies of Agricultural, Health and Commodity surveys rather than surveys of heavy equipment manufacturing installations. In the same way, Business Statistics relevant to the Nigerian situation might not be the Wall Street or the Dow-Jones type, nor should Health/Medical Statistics omit basic health care surveys in preference to surveys of carcinoma. Failure to recognise the need for this adaptation has drawn sharp criticisms from practicing statisticians.<sup>2,6</sup>

Two main needs dictate this adaptation: employment opportunity of graduates and maintenance of academic standards. How to satisfy the two needs

is the well known problem of bridging the gap between theory and practice.

### How We Teach

A few simple but useful approaches to the problem, are as follows: (i) Start early to integrate probability and statistics; (ii) Emphasize those aspects of the theory that have ready applications; (iii) Give applications only after the theory has been fully explained; (iv) Graduating students in statistics are to carry out a project.

### Shortage of University Teachers of Statistics

This is a near universal problem. In Africa, it seems to elude immediate solution. In the entire Nigerian university system, there are less than fifty statistics lecturers, and the situation in other African countries is not any better. However there is hope that postgraduate programmes in Statistics will expand in the next few years. Meanwhile our search for teachers continues in all countries, within and outside Africa, although this will not produce a satisfactory solution to the problem (no country seems to have surplus to spare). The answer surely lies in the development of local manpower, even if it means recruiting at masters degree level, persons that show high promise. We have tried this method and it works.

### Teaching Aids and Other Facilities

1. Books and Journals: Almost all the text/reference books, journals and other periodicals used in our universities are imported from non African countries. Because of the import restriction policy of a number of governments of African countries, the timeliness of some of the books and journals is lost. These problems throw a challenge to African educators and publishers and efforts are now being intensified towards being self reliant in some areas.
2. Computers: Calculators and computers are necessary tools for teaching statistics.<sup>2</sup> In Africa we embrace this practice subject to obvious constraints. Care should be taken to ensure that students understand the basic processes of Arithmetic before they are exposed to calculators and computers. Perhaps the most frustrating experience in the use of sophisticated equipment in some developing countries is the lack of necessary infrastructural facilities. In some cases, the maintenance of these equipments is not readily available, and when it is the costs are prohibitive.

### Training Professional Statisticians

This training may be formal, on-the-job or both. On-the-job training is used in most Anglophone African countries, in spite of its supervision problems,<sup>4</sup> while in most Francophone African countries institutional

training programmes established in 13 different centres in Africa and 2 in Europe,<sup>3</sup> are used. In each country, the Governments, the Statistical Associations and the Universities should get together to fashion out the most effective mode of training.

### Continuing Statistical Education

Statistical Education does not end at graduation. Both the consultant and the academic statistician need to continue their education by attending meetings, conferences, refresher courses etc. In addition to the Local Statistical Associations from the individual countries, there is a need for African statisticians to get organised and reach out to other national and international professional groups. Here mention must be made of the emergent African Statistical Association that aims at fulfilling these objectives.

International Organisations like the ISI, ECA and UNESCO have in various ways been helpful in reducing the effect of remoteness of Africa from the world centre of activity in Statistical Education. The hope is that other organisations would also join in this worthwhile crusade.

### Summary

The problems of Statistical Education can be put into two categories: (a) Problems that are near universal: Acceptability of Statistics as a distinct area of study; insufficient number of statistics teachers at different levels; balance between theory and practice in teaching statistics. (b) Problems that are culture oriented: remoteness of Africa; inadequacy of modern facilities: books, journals, computers for teaching statistics at various levels. For problems under category (a), our solutions are not any different from the ones already suggested and discussed by many eminent statistics educators.<sup>7</sup> For category (b) problems we suggest:

1. More Self Help: (i) African statisticians should get together and do more to develop Statistics and Statistical Education in their regions. Exchange of students/teachers, library and other facilities can be arranged among various regions of Africa, e.g. between the East and the West. (ii) African Governments should be persuaded to take more than a passing interest in the development of Statistical Education. (iii) The use of computers and other equipments is advised, provided there are adequate facilities not only to install but more importantly to maintain them.
2. External Cooperation: Foreign Governments, Institutions, Foundations and Organizations could help the developing countries to improve their Statistical Education by sponsoring or facilitating postgraduate training of their students and teachers; giving support for computer, journal and text book purchases and upkeep; encouraging their members to attend conferences and interact with their peers the world over. Exchange of students/teachers between the developed and developing countries would be of immense mutual benefit.

## References

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