TRAINING OF LECTURERS AT MASENO UNIVERSITY, KENYA

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Lecturers in Kenyan universities usually start their work without any prior training on how to teach students. Hence the teaching tends to be traditional and new training techniques are rarely implemented. For effective teaching, lecturers need to develop skills on preparation and presentation of new course materials, using modern methods. One of many changes to the statistics teaching at Maseno University was to teach an MSc. course in a way that also provided staff training. The course combined an international e-learning course with lecture notes which had previously been taught by a visiting lecturer. Two junior staff were given the day to day responsibility of teaching the new MSc course, with a senior lecturer observing, advising and taking overall responsibility. This paper describes the course and the learning experience.

INTRODUCTION

One of the challenges facing statistics education in Kenya is the lack of professional training of lecturers. Little effort is made to help new lecturers get exposed to the methods and techniques for the effective and modern teaching of statistics. As such, their capabilities to be innovative in teaching are limited and their teaching approaches tend to be traditional.

Most often it is assumed that knowledge of statistical content equals effective teaching of statistics. However, past research has shown that the knowledge of content is not enough to make one an effective lecturer of statistics, (Batanero et al., 2007). Over and above the knowledge of statistical content, it also takes knowledge of skills necessary for effective teaching and learning processes.

Recent developments in statistical practice have dictated changes in the teaching of statistics, (Chance et al., 2007). As such, the skills needed for effective teaching of statistics have changed over time. For example, the use of computers and real data sets has brought changes in how and what we teach in statistics. Such trainings may also be used to expose new lecturers to the techniques and skills relevant to the modern teaching of statistics.

At Maseno University, as part of a bigger initiative to modernise statistics teaching (Stern et al., 2010b) an MSc. course was offered in a way to include training of lecturers. Two new members of staff, referred to as the lecturers from this point, were to be trained. One was an existing young lecturer who already had teaching responsibilities and the other was a graduate assistant completing his M.Sc. project work. They were supervised by a more experienced lecturer, referred to as supervisor from this point, who is heavily involved in the modernisation.

The lecturers shared the lecturing and practical sessions, under the supervision of the supervisor, who had full responsibility for the course as a whole. The course was designed to bring together modern teaching methods which the new lecturers had experienced and appreciated as students. In this paper, we describe the course, how it was offered and the training experience.

THE COURSE

The entire course was made up of two parts; the presentation of materials on 'Analysis of Variance' and participation in an online course namely Statistics Made Simple. The 'Analysis of Variance' materials were already prepared and had been used by a guest lecturer who had taught the same course in its previous run. However, the inclusion of an online course as part of the whole course was a new idea adopted in the current run of the course. At the end of the course, the students worked on a mini-project which was marked as the Continuous Assessment Test (CAT) and thereafter sat for a written exam. The lecturers had attended the guest lecturer's course and participated in the previous run of the online course.

The online course

The e-learning course Statistics Made Simple, abbreviated as e-SMS and offered by the Statistical services centre at Reading University, (Dale et al., 2010), is about understanding

variability. It includes essentials needed to describe data well, make good generalisations; it covers concepts and uses of p-values and establishes the ground work for statistical modelling based on simple regression analysis. This seven-week online course uses peer-to-peer and student-to-tutor interaction to encourage learning and ensure completion. The course uses open source learning management system called Moodle, hence participants are expected to be competent in the use of the internet. It was offered to provide the first year post-graduate students with basic skills required for data handling and statistical analysis. This idea was born out of a recommendation by the lecturers, who are past participants of the course.

This facilitated online course provided the lecturers with training on student support and guidance. They were asked to provide the students with both technical and statistical support to help ensure successful completion of the online course. An example of technical support provided to the students was the use of internet as some of the students were not competent. Statistical support included responding to questions of statistical nature posted on forums. This skill was further developed during practical sessions where the lecturers were required to take the students through the practicals.

The 'Analysis of Variance' materials

They comprised lecture notes and their corresponding practicals which were in PowerPoint Slides and Word respectively. The lecture notes introduce students to key statistical concepts such as exploratory data analysis, before discussing regression ideas and analysis of experimental data. These practicals are computer-based and most of them involved description or analysis of datasets. The statistical package GenStat for windows was used, without cost under the discovery edition licence, and students found it powerful yet accessible and user friendly.

The lecturers adapted the materials to suit the needs of the students, and often they worked together helping one another. After the first few sessions the supervisor only participated in the preparation when the lecturers asked for help. This provided the lecturers with experience preparing course materials, without the complications of starting from scratch, often very minimal changes were needed.

The Continuous Assessment Test (CAT)

The e-learning course e-SMS provided an online component of the CAT in the form of CAST (Computer Assisted Statistics Textbook) tests, (Stern et al., 2010a). These tests consist of interactive exercises containing randomised data so each test is unique, and the students get instant feedback and marks after the test. We allowed students to take the tests more than once so they could master the concepts. This counted for 10% of the total course, which is a quarter of the total CAT mark.

The component of the CAT was based on a statistical game called tomato, (Mead et al., 1973) and (Stern et al., 2009). In this the students design an experiment, growing imaginary tomatoes in a greenhouse, then collect data corresponding to their design and analyse it. Each student wrote a report and presented their findings to the rest of the class.

The lecturers and supervisor were all actively involved in the student's presentations and reports. The marking scheme and marks came from joint discussions between lecturer and supervisor.

The Exam

The written exam was administered as the final assessment of the course to the students. The exam comprised five questions in total, three questions were from the materials on 'Analysis of Variance' and two questions from the e-learning course. It contributed 60% of the marks for the course.

The lecturers were heavily involved in writing of the exam but the final decisions and overall responsibility was the supervisor's. This was a lengthy process with a number of iterations and discussions; however at the end all involved felt that it had been worthwhile. The marking was a joint affair with lecturer and supervisor sitting together to mark. Since there were not too many scripts, this was an easy and useful exercise.

THE TRAINING EXPERIENCE
    The lecturers and supervisor all feel that the experience benefitted all involved.

Training of lecturers in the course
    The lecturers' experience, attending the guest lecturer's course, inspired and challenged them to upgrade their teaching skills to a similar standard. Building from the existing material provided a realistic challenge, in the preparation of course materials and their presentation, which embraced the new teaching methods. The drive to teach the course in this way came from the lecturers and not the supervisor. So the supervisor's role was to provide a platform through which the lecturers could experiment and learn safely.
    The supervisor had full responsibility for the course, and was always present in the class. Lecturers took responsibility for their own lectures and practicals. It was the lecturers' decision to determine the exact content of the course, and how to share the responsibilities of an individual lecture session. Most often decisions were made through peer-to-peer discussions but occasionally the supervisor was involved.
    The constant presence of the supervisor in the lecture sessions was important but, after the first few sessions, there was relatively little to do. In the first few sessions, the supervisor played an active role in the lectures occasionally stepping in to assist the lecturers and giving detailed feedback at the end. As the semester progressed, the lecturers were much more confident and independent. Throughout the course the supervisor was involved in the class discussions and this helped reinforce the lecturers' learning of the subject material.
    A normal work load for a junior lecturer at Maseno is three full undergraduate lecture courses a semester, each having three contact hours a week. As part of this training the work load was reduced to a single undergraduate course along with the participation in this training. This reduced load was essential since the amount of time spent preparing for each session was considerable. Having two lecturers made the preparation time manageable. An added benefit to having two lecturers was that they were able to learn from and support one another.

Future plans for lecturer training
    This training is a small part of a bigger initiative to improve and modernise statistics teaching at Maseno University, (Stern et al., 2010b). There is therefore a need for training of lecturers so that more people can be involved in this process. However the initiative for training has to come from the lecturers themselves so that they engage fully. So future training initiatives will be tailored to the individual lecturers involved.
    This semester the same group of lecturers are involved in a second training initiative. They will prepare and give the first half of a new M.Sc. course, called "climate variability and climate change", and the second half will be given intensively by a guest lecturer. The idea is that the basic material is taught before the guest lecturer arrives, to make better use of the visit. A second run of the whole course will then be given by the lecturers themselves with minimal support.
    This training is already affecting more than just the participants in the course. The lecturers involved are beginning to bring what they have learned into their undergraduate teaching and some colleagues are also changing their teaching methods. The aim is to keep working with individuals helping them to achieve their potential and hope that this has a knock on effect with others.

CONCLUSION
    Using this M.Sc. course for training purposes had a positive effect on the students. They appreciated the course and how it was given, as well as the fact that they had three lecturers they could call upon with varying levels of experience. This reinforces the value of the training to the lecturers. Having given the course once in this way, the lecturers now feel capable of giving a similar course on their own, if the opportunity arises.
    The integration of the e-learning component, e-SMS, to this course was highly successful. It provided the students with numerous transferable skills that helped in other aspects of this course and will continue to be of value throughout their degree, and beyond. It was not difficult to derive an examinable component from e-SMS.

The fact that this initiative builds from guest lecturers, adds value to their visit because their influence has become long lasting. This is important for the satisfaction of the visitor as well as the development of the department.

The only conclusion about training of lecturers that we can draw from this experience is that our success was facilitated by a few key elements; the individuality of experience, the fact that the responsibility of the course was the supervisor's and most importantly the lecturers took the initiative.

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