

# BENCHMARKING EDUCATIONAL QUALITY IN AFRICAN UNIVERSITIES: THE CASE OF THE DEPARTMENT OF MATHEMATICS AND SCIENCE EDUCATION, UNIVERSITY OF BOTSWANA

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## **Abstract**

*A common mode of benchmarking educational quality in the world of academia is through the system of peer review. This system of benchmarking educational quality in many an African university adopts the use of external examiners to moderate academic programmes and student academic performances. But this system of external moderation was abolished about six academic years ago at the University of Botswana necessitating the establishment of an academic quality assurance regime for benchmarking educational quality in the University. The Centre for Academic Development (of the University) which was charged with the responsibility of developing pertinent guidelines for monitoring the new system mounted a series of workshops in aid of academic departments a year or so before the commencement of the new dispensation. A lot of efforts were devoted by the university academic departments to craft policies and procedures for academic quality assurance. For example, the Department of Mathematics and Science Education mapped out quality assurance matrices in five key areas of (i) academic programmes, (ii) teaching and learning episodes, (iii) teaching-learning resources, (iv) academic staff matters and (v) student matters. In the area of staff matters, for example, staff recruitment, staff development, staff retention and staff appraisal were covered. This write-up examines the procedures put in place in the Department to enhance and guarantee quality assurance of its academic programmes.*

**Key words:** *academic quality assurance, moderation of students' academic work, educational quality.*

## **Preamble**

Universities are among the few establishments, the world-over that internally moderate themselves with a view to ensuring that set goals and targets are met with high quality. For example, to progress through the academic ranks in a university, it is a requirement for a budding academic to submit himself or herself to a system of assessment tagged 'peer-review system' in the world of academia. It is a must for such an academic, for his/her upward mobility, to get published in internationally reputable academic journals whose cornerstone is peer-review system *par excellence* as a way of benchmarking the worth of his/her publications. The story does not end with academic staff alone. Assessment of students in many an African university is not only internally moderated but also externally vetted as a way of benchmarking the educational

quality of their academic programmes. The practice in all English-speaking sub-Saharan African universities (for example, University of the Western Cape, 2007) is to have the academic performances of their students moderated by senate-appointed external examiners from other universities the world-over. These external examiners are normally of the rank of senior lecturers and above and their fundamental duty is to bench-mark the academic programmes *vis-à-vis* student academic performances against best practices in the world. The University of Botswana, up till the 2000/2001 academic year, subscribed to this system of quality assurance as could be gleaned (see below) from Clause 20.51 of her calendar for that year.

Evaluation of a student's performance in the degree programme shall be based on continuous assessment and examinations, In Year 1 and Year 1 level courses, the examination shall be internally moderated, while in subsequent years, the examination shall be formal and **externally moderated** (Bold, mine). Normally, the external examiner's assessment shall not be overruled by the internal examiner, but the final decision shall rest with Senate (p. 20).

It is crystal clear from the above that the external examiner is vested with a good measure of authority even in pronouncing a 'failed student passed' and vice versa; and where the departmental board of examiners of which the internal examiner is a member is not agreeable to his/her decision, the external examiner's assessment of the candidate takes precedence unless otherwise over-turned by the highest academic body (the senate) of the university. Externalisation of students' assessment in those days took the form of inviting external examiners to the university for a period of a week or so at the end of the academic year which normally fell due around the end of May. Such examiners were normally marooned in their hotel rooms during their moderation of student worked examination scripts in year-long courses and end-of-programme projects; and at the end of their work, they were required to provide each lecturer whose marked scripts were moderated with a feedback in areas such as fairness in grading, consistency in grading and like in addition to the submission of comprehensive moderation reports to the university authority.

The University of Botswana in its wisdom changed from year-long courses to semester-based ones during the 2001/2002 academic year. With the introduction of semester-based courses, during that academic year, it became apparent that external moderation of students' worked scripts had to be reviewed. For the system of externalisation to continue the way it was during the era of year-long courses, students' worked scripts during the first semester ending in December of every academic year would have to be 'banked' and made available to the external examiners at the end of May as usual. This option was by any stretch of imagination unworkable as students had to know their academic standing in courses taken by them during the first semester for their registration in the second semester as many of the first semester courses might, in fact, be pre-requisites for second semester courses to be taken by them. The other alternative in maintaining the *status quo* was to invite the external examiners to the university twice a year, in December and May respectively. It does not take a genius to know that the cost of such an operation will be a determining factor.

Due to logistical problems associated with 'student worked scripts banking' and/or the prohibitive cost of inviting the appointed external examiners twice each year, the system of externalisation had to be jettisoned by the university. In its place comes the new dispensation of injecting quality assurance into the academic regulations with the senate of the university determining 'the system of quality assurance of programmes of the university' (University of Botswana, 2002). The university then mandated its Centre for Academic Development (CAD) to come up with the modalities for ensuring quality assurance in its academic programmes.

## The role of CAD

CAD by its mandate is the vanguard of academic quality assurance in all its ramifications in the university. This is in line with the current global practice on benchmarking academic

quality at tertiary educational system (Duff, 2008). First and foremost, a decision was arrived at that there would be two forms of quality assurance system, *viz*, internal and external. The internal one is expected to be on a continuous basis with each academic department striving to maintain the integrity of its programmes and the external one taking place once every four to five years depending on the nature of the programmes of a department. The external moderation this time around is expected to be much more comprehensive than the old one with the 'external's' (now designated external reviewers instead of external examiners) spending more time on the campus to review in detail: i) student performances (over the preceding years), ii) academic programmes, iii) staffing situation, iv) teaching and research facilities etc. of the designated department.

To give effect to its mandate, CAD came up with a number of publications dealing with best practices in educational quality assurance and organised a series of workshops to familiarise academic staff with the spirit and thrust of its proposed quality assurance system. In addition, CAD staff also visited all academic departments within the university to give necessary advice and orientations to academic staff on the way forward. CAD then facilitated the exposure of academic staff of the university to a programme of e-learning covering areas such as WebCT Course Design, Web Design, PowerPoint Usage, Information Management Technology, Scanning Technique, Teaching in the SMART Classroom, On-line Information Gathering Technique, Video-Conferencing and Multimedia Input Devices to mention but just a few.

Of pertinence to this write up are three CAD documents dealing with i) standards and criteria for internal quality assurance, ii) sources of information for academic quality assurance and iii) guidelines for the appointment of external reviewers. The document on standards and criteria for internal quality assurance covered seven main areas of a) quality programmes and courses, b) quality academic staff, c) quality teaching and learning experiences, d) quality in student assessment, e) quality in support services and documentation, f) quality in resources and equipment and g) quality of research. In each case, criteria that can be used to measure performance standards akin to the ones put forward by the Academic Quality and Standards Unit of the University of Salford (University of Salford, 2008) are spelt out. And to further assist in the charting of the way forward, a compressive list of sources where pieces of information required for gauging standards in each of the seven areas was provided. For example, the list for quality programmes and courses include sources such as 'departmental handbooks, course outlines, programme approval document, UB calendar and UB academic quality management policy'. There is also a CAD document on guidelines for the appointment of external reviewers which covers areas dealing with their nomination/appointment, their role, UB expectation and the processing of their reports.

### **Benchmarking academic quality in the Department of Mathematics and Science Education (DMSE) of the University of Botswana**

Based on the above premise, each and every academic department within the university was encouraged to come up with pertinent modalities for ensuring and maintaining the quality assurance of its programmes. The author was privileged to chair the committee set up by his department to advise its board on the modalities for going about academic quality assurance in the department. What follows are the highlights of the adopted 'policies and procedures' by DMSE board for quality assurance matters in the department (DMSE, 2005). By 'policies', one means broad but well articulated guidelines for the implementation of quality assurance programme/scheme in the department. The policies were indeed 'categorical statements of ideas indicating [departmental] perceived orientations for the achievement of [its] dream goal'. They are designed to underscore the thrust of the department in academic assurance matters and in so doing chart out well-defined path to ensure that all quality control actions taken in the department are done systematically and methodically. 'Procedures', in their own case, cover well-defined ways and means of actualising the stated policies.

Five distinct areas were covered by DMSE quality assurance scheme (DMSE, 2005). These are:

1. Policies and procedures for academic programmes encompassing the strategies for new course/programme design and old course/programme revamping.
2. Policies and procedures for learning and teaching chores covering, amongst other things, learning/teaching environment in the department.
3. Policies and procedures for teaching-learning resources for the facilitation of learning.
4. Policies and procedures for academic staff matters dealing with staff recruitment, development, retention and assessment.
5. Policies and procedures for student matters covering all aspects of student academic welfare.

Below are the highlights of some of the policies agreed by the department in each of the following five areas:

**a) Programmes /courses**

- The development of new programmes ‘shall be client-driven’ and/or predicated on changes in educational policies in the country.
- The revamping of existing programmes shall be based on feedbacks from end users and former products of the department
- Existing programmes shall be reviewed after a full cycle of its implementation.
- There shall be both internal and external reviews of programmes.

**b) Learning-teaching episodes.**

- Reflective learning on the part of the student shall be encouraged.
- Student learning environment shall be made as conducive as possible.
- The learner shall take responsibility for learning.
- There shall be a departmental teaching philosophy.
- Incoming academic staff shall be duly oriented and exposed to departmental teaching philosophy.

There shall be a system of mentoring in aid of teaching improvement.

**c) Learning-teaching resources**

- Technology-assisted learning shall be encouraged.
- Technology shall be required to impact positively on staff teaching chores.
- Provision of pertinent teaching and learning resources in required number and sophistication shall be pursued.

**d) Academic staff issues**

- Staff recruitment procedure in the Department shall embrace the doctrines of gender sensitivity.
- There shall be well-articulated staff development scheme on training, collaborative research, technology support and mentoring.
- Up and coming academics shall be encouraged to get published in recognised academic outlets.
- There shall be equitable staff welfare strategy in place in aid of staff retention.
- Peer-review system as well as self-assessment regime in the three assessable areas shall be encouraged.

#### e) Student issues

- The student shall take full personal responsibility for his/her studies.
- The student shall be required to embrace the doctrines of academic professionalism.
- Student assessment shall be carried out objectively and feedback shall be given timeously.

To give tooth to each of the policy statements, the department came up with well thought-out procedural suggestions for the actualisation of each of them. The example below on academic programme/course design and review gives a taste of the scope of the suggestions under each of the five areas covered above.

- [Pertinent] documents shall be content analysed by the department to tease out pertinent portions [of such documents] for programme development.
- The department shall 'sell' itself to its immediate environment and beyond. One way of doing this is to have well articulated and regularly updated flyers, in print and electronically, dealing with the areas of expertise, research concentrations, future directions etc. of the department.
- DMSE-INSET [DMSE In-service Training Outfit] shall be expected to play a pivotal role in selling the department to its immediate environment.
- Robust needs assessment shall normally be carried out to determine the level of client interest before a proposed programme has a slot in the departmental plan.
- There shall be a departmental brainstorming session on a yearly basis to deliberate on the efficacy of each and every running programme in the Department.
- Tracer studies through the auspices of DMSE-INSET canopy shall be carried out yearly to reach former students of the department to document the relevance of their training to their teaching chores.
- The department shall come up with a mechanism for obtaining feedbacks from relevant departments of the Ministry of Education.
- Necessary strategy shall be put in place by the department in line with the university policy on external assessment of programmes [to appoint] external assessors (DMSE, 2005).

### **The current quality assurance practices in the department**

To operationalise the elements of the quality assurance paradigm adopted by the Department of Mathematics and Science Education of the University of Botswana, the following practices are religiously carried out by the department each semester:

The continuous assessment (CA) of both the CA-components of examinable courses and the courses whose overall assessment are by CA-only is internally moderated. This moderation entails checking the questions/assignments/projects for CA inputs against their respective course outlines to ensure content validity from the word 'go'. This is followed by the moderation of students' worked scripts. This moderation exercise is normally guided by comprehensive and detailed marking guides supplied by the course lecturers. Each moderation exercise is accompanied by a report underscoring the strengths and the weaknesses of the moderated courses. This is with a view to providing feedbacks on the moderated courses for the benefit of the respective course lecturers.

Examination question papers for examinable courses are also internally moderated. This exercise is carried out by the executive committee of the department comprising senior academ-

ics in the department. Moderated question papers are then returned to their respective course lecturers for necessary corrections/modifications, if any.

There is a well articulated procedure for examination paper processing in the department; and the grading of worked examination papers are done with the aid of elaborate marking guides. The student graded examination worked papers are then subjected to internal moderation to ensure objectivity and consistency in the grading of the papers.

The overall student grades in each course are approved by the Departmental Board of Examiners made of all academics in the department before they are released by the department to other arms of the university for further necessary processing.

The department's programmes are due for external review and plans are in place to ensure that this is a hitch-free exercise. For example, the external reviewers for the department's academic programmes, at both undergraduate and graduate levels, in both mathematics education and science education areas had been appointed by the university. And in preparation for the arrival of the appointed external reviewers, the department had carried out the internal reviews of its academic programmes in line with CAD suggested seven core areas [viz; i) Quality of course and programmes ii) Quality of academic staff iii) Quality of teaching and learning experience iv) Quality of student assessment v) Quality of support services vi) Quality of resources and equipment and vii) Quality of research].

## Conclusion

Since the introduction of the new system of quality assurance regime about six years ago in the university, the department has had no cause to design any new programme. But when the time comes to do this, the exercise shall, no doubt, be guided by the spirit of the new dispensation. For example, the newly approved university template under the new system shall be complied with and thorough needs assessment will be carried out to ensure that, to a reasonable extent, such a new programme is 'client-driven'. DMSE currently has in place a system of getting feedbacks from its former students through at least two different sources, namely i) DMSE-INSET outfit that liaises on a regular basis with all secondary schools in the country for the purpose of 'workshopping' practising secondary school science teachers in identified areas of need in the teaching of school science and mathematics and ii) DMSE staff yearly contacts with former students during teaching practice exercise. There is also a plan in the department to establish a research outfit within the armpit of DMSE-INSET to carry out tracer studies to document the strengths and weaknesses of existing programmes of the department through the eyes of its products.

The department has files (including electronic ones) for each and every course on offer where course outlines, tutorial question papers, assignment question papers, test papers, past examination question papers are kept, among other things, in aid of new course lecturers. The system is now being upgraded so that every lecturer in the department can electronically access it from DMSE website from the comfort of his/her office. It should be noted in passing that this section of the departmental website will be available only to DMSE academic staff.

For mentoring and collegial reasons, many courses are co-taught in the department. This gives a good opportunity for colleagues to exchange notes on their teaching styles if they so choose from other colleagues. This also gives room for both self-assessment of one's teaching and informal peer review of one's teaching. Emphasis is placed on reflective learning where students are encouraged 'to learn how to learn' rather than the cramming of concepts and the like. Being a teacher education department, emphasis is also placed on learner-centred teaching technique to underscore the fact that DMSE lecturers practise what they preach.

For staff development, the department encourages collaborative research endeavours. It has in place monthly seminar presentation scheme where staff members are encouraged to share their research findings with other colleagues for necessary inputs. The department contemplates having a series of academic publication outlets in the department including the publication of edited seminar papers as a seminar series publication in the near future

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