

LOOKING FOR A 'QUALITY ASSESSMENT MECHANISM' FOR TEACHING ENGINEERING TECHNOLOGY THROUGH OPEN AND DISTANCE EDUCATION

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ABSTRACT

Although general courses related to humanities, social sciences, education and pure sciences are popularly taught through distance mode, through the institutions involved in teaching distance mode techniques for some time, more practical application courses such as engineering technology and applied sciences are less popular as distance mode teaching till recent. The current technical advancement is making it possible for more practical application courses to be offered through distance education techniques. The Faculty of Engineering Technology of the Open University of Sri Lanka is one of the few faculties involved in teaching of engineering technology through distance mode in the region. Faculty offers courses leading to diploma in technology, bachelor in engineering technology, postgraduate diplomas and postgraduate degrees in engineering through distance mode. The diplomats and graduates passing out from the faculty have to compete with the diplomats and graduates passing out from the conventional universities in the common job markets. Hence to maintain a high quality of the diploma/degree is important. Attempt is made to develop a quality assurance system that will help to maintain a high standard of the faculty diploma/graduate output. This study investigates the strengths, and in particular the weaknesses of quality assessment practices used in conducting subject reviews in Sri Lankan universities, especially when it comes to subject reviews in relation to more practical application courses such as engineering technology and applied sciences. This paper describes the aspects that were looked into: adopted current practices & the weaknesses, areas identified to check on quality maintenance, and measures to be taken to improve in developing a quality assurance mechanism based on the Faculty of Engineering Technology at Open University of Sri Lanka.

Keywords: engineering technology, ODE, quality assessment, quality assurance.

Maintenance of quality of education at tertiary education institutions is of utmost importance in the modern competitive market. Unless high standards coupled with quality programmes are offered through these institutions, they will not be attractive to the society, and the student clientele, who are more knowledge and job oriented than couple of decades back. Hence to support high educational standards and offer good programmes, an effective evaluation system, or in other words an effective quality assurance mechanism is essential.

The mechanisms used for quality assurance in institutions where teaching is conducted through distance mode, should be different to the mechanisms used in conventional

institutions. Especially when it comes to more practical application courses such as engineering technology and applied sciences the mode of teaching becomes even more significant. Hence the quality assurance mechanism used for subject reviews should be more sensitive to the teaching mode and should be able to count on all the differences in the two systems before establishing any conclusive judgments.

Although a quality assurance toolkit has been developed for evaluation of distance higher education institutions (COL, 2009) this does not sufficiently cover more practical application courses which are offered through distance education techniques. The aim of this study is to look into means of developing a quality assessment mechanism for institutions involved in teaching engineering through distance education by taking Faculty of Engineering Technology at Open University of Sri Lanka as a case study.

BACKGROUND

As cited by Braimoh (2002) despite the glowing virtues of distance education, it is commonly and regularly under fire by public who ostensibly consider this process of teaching and learning as an inferior type of educational acquisition. Paradoxically, however, distance education, according to Lephoto (2000) has great potential in that it is used to provide for more than what the formal system can do. Although how much it is argued about the effectiveness of distance education, the reality is that, this mode of education is attracting large student populations: perhaps more than the face-to-face systems. It is also important what type of subject matter is being taught through distance mode; for example if swimming is to be taught without getting in to water. Could we expect a champion? An ordinary swimmer may be a possibility. Hence realistic expectations!

Weerasekera (2002) suggests the success rate of an institution involved in distance learning can be measured differently compared to conventional universities. Similarly the quality assurance of such institutions should be conducted differently to the conventional universities. In the study conducted by Weerasekera (2002) concludes that the model proposed to measure the success rate at the Faculty of Engineering Technology has to be sensitive to measure the impact the faculty has on learners, to give a true picture of the performance of the faculty. Hence the quality assurance models used for such institutions should be fair and doing justice to the institutions involved in distance-learning by taking in to account of the mode of education, its characteristics, and subject evaluator's familiarity and expertise knowledge on distance mode teaching.

This study investigates the strengths, and in particular the weaknesses of quality assessment practices used in conducting subject reviews in Sri Lankan universities, especially when it comes to subject reviews in relation to more practical application courses. Through this study an attempt is made to highlight the essential components of developing a realistic quality assessment mechanism, which can be effectively used to assess more technically biased courses taught through distance mode by taking Faculty of Engineering Technology at Open University of Sri Lanka as a sample.

AIMS & OBJECTIVES OF ENGINEERING EDUCATION

Following are the aims and objectives of the degree programmes offered at the Faculty of Engineering Technology. On successful completion of the Bachelor of Technology (Engineering) degree, the students should have:

- obtained a knowledge and understanding of the subject areas of the compulsory and chosen elective courses to a breadth and depth required to practice as an engineer by applying such knowledge acquired, in to real practical situations,
- acquired the competency to analyse engineering problems and find appropriate solutions, and to execute such solutions,
- developed the motivation to use his/her creative and analytical abilities to influence the society for the better;
- attain on-the-job practical skills through the two modules of industrial training embodied in the curriculum.
- ability to undertake an engineering project on his/her own, conduct field surveys and data gathering exercises, analyse data, produce a self-contained piece of work, conduct presentations, and write it up for others to assess and use.

To help the students to achieve above outcomes, the programmes of study provide opportunities for students to:

- build upon their qualifications at entry by progressively developing knowledge and skills based on a multidisciplinary approach;
- continue studies in fields in which they have an interest or talent by offering a choice of elective courses within a flexible curriculum with lower and upper limits on various categories of courses (engineering, mathematics, projects, general, management, computer literacy, training and language);
- undertake a final year project (in the degree programme) on a topic relevant to the work (employment) he/she is engaged in;
- have a manageable workload by providing guidance on the selection of courses within permissible limits, based on the availability of time for the individual;
- be provided with complete details of the programme, course and unit objectives, content, academic requirements and assessment methods;
- receive fair and appropriate assessment of their work, and feedback on individual progress;
- have access to adequate academic support and resources directly from the department and through the network of regional/study centres.

METHODS

Any Quality Assurance Mechanism which is to be developed should be able to enhance the aims and objective discussed in the above section by looking at the process from a distance teaching point of view.

Although a quality Assurance Toolkit for Distance Higher Education Institution and Programmes (COL, 2009) has been developed recently, this document does not sufficiently deal with the quality assessment process of more technically biased courses taught through distance mode. COL (2009) toolkit mainly consists of three sections, namely; (i) guideline for use of the toolkit, (ii) standards and performance indicators, and (iii) best practice case studies

from across the Commonwealth that can serve as exemplars as institutions consider their respective situations and options.

Going by the main topics of the Quality Assurance Hand Book - Sri Lanka (2002), following are the suggested components of a 'subject review' that should go in to a quality assurance system. Following areas have to be more specifically looked at in an improved Quality Assurance Mechanism with appropriate performance indicators.

1. Curriculum design, content and review:

Curriculum should be designed such a way the subject knowledge imparted on the student should match with the conventional university student.

In technically oriented courses such as engineering the practical knowledge imparted on students through industrial training, workshops, laboratories and field studies should be equally or more sound than the conventional university student.

Maximum advantage should be taken of the distance-learning students who are engaged in the industries related to the courses they offer.

The subject review should closely look at the curriculum design, content and review while being mindful about the course delivery methodologies adopted in distance learning.

2. Teaching and learning infrastructure and resources:

Teaching resources should be learner supportive since the students are mostly self-learning compared to conventional universities. Web based teaching tools should be exploited to the maximum.

Due to lack of frequent face-to-face lectures the study material should be more user friendly and self-explanatory nature. In technically oriented courses such as engineering development of such course material and learning infrastructure and resources is immensely demanding and high degree of skill is required in developing those. This is a much more overall demanding and costly exercise than developing lecture notes in a conventional university.

3. Assessment arrangement:

Student assessments to be conducted on more regular basis (such as continuous assessment methods) than in conventional type universities to ensure that, the knowledge imparted on students are properly absorbed and understood by them. Assessments could be more web base, to suit the remote students as well as employed students.

4. Research & postgraduate studies:

Unlike in conventional universities, in distance learning institutions the student cliental is mainly coming from industry, this advantage could be made use to conduct more industry biased research. Students who are employed in the industry; their knowledge, experience and awareness of specific specialized areas could be made use for research &

development. Performance indicators should be sensitive to grasp these beneficial situations.

5. Quality of students:

It is proper to maintain a reasonable standard in the quality of students who gain admission to the engineering stream. They should be of an acceptable level where they have the capacity, and ability to continue the programmes. Since there is no definite entry level requirement, there is always the danger of the programmes being flooded with students who are unable to complete. Hence maintaining an acceptable level in the students who get entry to the programmes will minimize excessive dropout rates halfway during the courses.

6. Peer observation University/industry/other partnerships:

Since many students come from the industry, their relationships with the industry and other partnerships could be used to maximize the benefits.

Moderation of examination papers by outside academics and subject expertise and incorporate their comments is an important exercise.

If accurate observations are to be obtained under this review the current practice of talking to few individuals are not at all adequate to come out with conclusive remarks. This is a much larger, extensive and time consuming exercise though lightly taken in the current evaluation process.

7. Skills development:

Performance indicators should be sensitive to identify the degree to which the courses contribute to develop the technical skills that students acquire, and their ability to correctly apply them in the field. Inclination for further development of skill and the student's readiness too should be measured accurately.

8. Academic guidance and counseling services:

Academic guidance and counseling is provided to the students from the time of enrolment to graduation from the university. Simple and effective performance indicators have to be developed to measure and assure the effectiveness of these services provided by the institution.

9. Extent of use of student feedback (both qualitative and quantitative)

It is required to obtain the student feedback and if required, use that information productively in all teaching/learning activities after critically looking at them.

When performance indicators or practical yard sticks are not specified or spelt out in detail and without ambiguity, in the existing guidelines which leaves a broad subjectivity depending on individuals.

PROPOSED TOOLS

In proposing an effective quality assessment mechanism for engineering technology the following tools; which should be well developed, are proposed.

- A toolkit that is sensitive to measure the user friendliness of course material, including texts and other educational assistance. The quality assurance team should be trained extensively to use this well developed toolkit to conduct the subject review without any subjectivity.

Evaluation of textbooks

The evaluation of a textbook lies in quality assurance, largely, on the subject-content of a given course. As suggested by Beck et al. (2002) evaluation of distance-learning textbooks are more complicated because the distance educational institutions should design and produce characteristically self-instructional textbooks to motivate the students for active learning. The three methods suggested by Beck et al. (2002) based on basic tools designed for tripartite evaluation, most cost-efficient method and positive promotion strategy are proposed for textbook evaluation. A comprehensive feedback from the students and users will together with comments from subject experts will provide a fair evaluation of the text books.

- A toolkit to measure the quality and user friendliness of any radio, television or video conferencing programmes.

Delivery

Distance education delivery methods have developed largely over the past 10 years to include more in the use of videoconferencing, teleconferencing and information technologies (Jelfs, 2002). Since some of these modern techniques are costly these delivery systems should made use to strike a balance between the levels of techniques used, and course fee structure adopted by the institution. Improve the existing system such a way to make use the existing resources to maximum efficiency

- Student feedback is an important component of the whole process. Develop methodologies to obtain a comprehensive feedback from the students who have followed individual courses and who are contributing the knowledge acquired at various levels in the industry. A mechanism should be developed to obtain any drawbacks and suggest corrective measures too.
- Feedback from industry and employers: A separate toolkit to gather accurate information on learner performance employed in the industry.

CONCLUSION

What is happens at the moment when subject reviews at OUSL are conducted, these reviews are carried-out by teams comprising of subject experts from conventional universities who are completely outsiders to the open and distance learning systems, who lack expertise and experience in this area of distance teaching, who lack proper toolkits to conduct the expected functions, they invariably get pushed in to difficulty. During the review period (which comprise

of few days) these academics from conventional universities have to go through the burden of getting accustomed to the ODL process in addition to their main responsibility of assessing & reviewing the work of established academic departments and come out with the subject review reports which is a quite a burden. Finally this leads to a greater subjectivity of the whole exercise, leading to a situation similar to 'getting lost in a jungle without having a compass in a cloudy night'. So you end up walking somewhere! Finally try to satisfy yourself thinking "at-least you are somewhere"!!

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