Quality Assurance in Statistics Education: From Departmental Self Evaluation to Accreditation

Abbas Bazargan
University of Tehran
P. O. Box 13145-314,Tehran, Iran
Abazarga@ut.ac.ir

Abstract

Student numbers in statistics education programs have increased rapidly during the past two decades. This is the case in developed as well as developing countries. Although, enrollments in these programs have increased, the question is: To what extent the quality of statistics education is assured and continuous quality improvement is planned and implemented? Furthermore, application of information and communication technologies in statistics education has provided the opportunity for providing statistical education programs through open and distance education. Such programs provide higher enrollments and lower funding per student. In this regard, the question is: What policies ensure that such programs do not lead to lower quality? Toward answering these questions, in the first part of the paper major trends in quality assurance approaches, in higher education in general and in statistics education in particular, are reviewed. Then, an outline of a model which includes self-evaluation followed by external evaluation is presented. Such a model intends to improve quality of statistics departments. Finally, as borderless statistics education is expected to be introduced in the near future, the need for an accreditation mechanism in statistics education is discussed.

1.Introduction

In the twenty-first century, developed and developing countries are aiming toward knowledge-based economies and knowledge societies (World Bank,2002). As such, greater value would be placed on statistical skills and knowledge. Furthermore, higher levels of participation at the tertiary education(OECD,1998) has increased student numbers in statistics education programs. As an example, enrollments at the departments of statistics of higher education in many developing countries expanded very rapidly during the past two decades. Expansion of students in statistics has brought greater diversity in student needs and expectations. Therefore, a growing concern is the quality and purposes of statistics education programs. Although, enrollments in these programs have increased, the question is: “To what extent the quality of statistics education is assured and continuous quality improvement is planned and implemented?" Furthermore, application of information and communication technologies in statistics education has provided the opportunity for providing statistics education programs through open and distance education. Such programs provide higher enrollments and lower funding per student. In this regard, the question is: "What policies ensure that such programs do not lead to lower quality?" Toward answering these questions, regional experiences of quality improvement, quality assurance and accreditation are reviewed. Then, toward promoting good practices in quality assurance in statistics education, a model which includes self-evaluation and external quality assessment is proposed. Finally, standard-setting in statistics education is discussed.

2.Major Trends in Quality Assurance Approaches

Structure of student population in higher education in the developed as well as developing countries has been changing (OECD,1998; Bazargan,2000). Although, this is a general trend in tertiary education,, it is the same in a field such as statistics. Considering the expansion of enrollments and diversity of student population in statistics programs, quality of statistics education should be of concern to the national and international community of scholars. Departments of statistics are expected to respond to the needs and expectation of the new student population. Toward this end, there should be mechanisms in place to assure and improve the quality . In this respect, during the past two decades efforts have been made in different countries toward quality assurance and quality improvement in higher education.

There are different definitions of quality (Lim ,2001:14).However, an instrumental approach to measuring quality in a program of statistics education is to define quality as the extent to which the program achieves its purpose(or mission) or complies with pre-established standards.

Based on the above, quality assurance(QA) in higher education may be defined as a process that examines the aims, structure ,inputs, processes, outputs and projected outcomes. Therefore, the QA is considered a general term which includes a range of data collection activities such as assessment, audit, evaluation and accreditation. Approaches to quality assurance are classified into three types: (A),(B) and (C) (Bazargan,2002:125). This classification is based on five distinguishing factors :(1)standards of good practice (criteria of merit), (2)type of self-evaluation, (3) type of external assessment, (4) dissemination of results, and (5) outcomes of the quality assurance process. While in type (A) standards are pre-established ,in types (B) and (C) standards are institutionally defined.

3.Internal and External Quality Assessment in Statistics Education

As mentioned previously, the QA process includes two components :self-evaluation(internal quality assessment) and external quality assessment(review). In the self-evaluation process, a department of statistics collects and analyses data on where it is and where it wants to be(objectives).In this process, strengths, weaknesses ,opportunities ,and threats are analyzed. Then, a development program is prepared to indicate how the department is going to reach the objectives(Kells,1995). As a result, self-evaluation report is produced. There are two approaches in carrying out the self-evaluation process: managerial and academic(Bazargan,2002). In the managerial approach, it is the head of department who is responsible for preparing the report. In this approach, the role of faculty members is negligible. However, in the academic approach, self-evaluation report is prepared through faculty participation and departmental engagement.

The external quality assessment is a process through which peer visits to the department is made and the self-evaluation report is validated. The results of an external quality assessment in a department of statistics(DS) validates the answers to such questions :
What is the DS doing?
What are its available resources?
What promises the DS has made to the students and other stakeholders?
Is the DS able to fulfill its promises?
What are the main strengths and weaknesses of the DS?

4. Standard-setting in Statistics Education

As application of information and communication technologies in higher education is increasing rapidly, virtual courses and programs in statistics education is gaining ground. These programs would expand the opportunity for providing statistical education through open and distance education. Such programs provide higher enrollments and lower funding per student. Based on the above, although , each department of statistics could define its own set of objectives ,and through self-evaluation and external quality assessment, review and validate its achievement at the national level, there is need for a kind of accreditation. Therefore, it is necessary to consider a set of standards in statistics education. Such standard could include policy framework and guiding principles. In this respect, Council for Higher Education Accreditation(CHEA,2003) defines standards as "the level of requirements and conditions that must be met by institutions or programs to be accredited or certified by quality assurance or accrediting agency. These conditions involve expectations about quality, attainment, effectiveness, financial viability ,outcomes, and sustainability." Such standards in statistics education could be proposed by the International Association of Statistics Education(IASE). The IASE could inspire and provide guidance in the accreditation of statistics education.

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Résumé

Le nombre d'étudiants inscrits dans les formations en statistiques a considerablement augmenté durant les deux dernières décennies. Bien que le nombre d'inscriptions dans ces formations ont augmenté, il subsiste une question clef: dans quelle mesure la qualité de l'enseignement des statistiques est elle garantie ainsi que la planification et l'implémentation de l'amélioration en continue de la qualité? De plus, l'utilisation des nouvelles technologies de l'information et de la communication fournit de nouvelles opportunités pour garantir l'enseignement et l'apprentissage en ligne et à distance des statistiques. De telles formations offrent, à la fois, un taux d'inscription plus élevé et un moindre coût d'encadrement par étudiant. Dans cette optique, une question subsiste: quelles politiques permettent de garantir le maintien d'un niveau de qualité élevé dans ces formations? Afin de répondre à ces questions

nous procéderons, dans une première partie de cet article, à une revue des principales approches pour assurer la qualité (quality assurance), en général, puis dans le domaine de l'enseignement des statistiques, en particulier. Puis, dans une deuxième partie, nous présenterons le cadre conceptuel d'un modèle incluant l'auto- évaluation suivie de l'évaluation externe. Finalement, dans une dernière partie et dans la perspective de l'enseignement sans frontière des statistiques, nous discuterons le besoin d'introduire un mécanisme d'accréditation pour les formations en statistiques.