

## DEVELOPMENT AND IMPLEMENTATION OF A SPECIFICATION FOR A DEPARTMENTAL QUALITY MANAGEMENT FRAMEWORK

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### ABSTRACT

*In the UK, external quality scrutiny of university engineering departments involves regular professional institution accreditation of courses and Quality Assurance Agency (QAA) assessment, together with internal university quality review mechanisms. Meeting the expectations of this scrutiny is a matter of importance to a department, made more difficult by the lack of a clear specification for the management requirements at departmental level, to fulfil the various internal and external expectations. Each engineering department has effectively been compelled to invent its own quality management system without assistance.*

*The Engineering Professors' Council (EPC), a national body representing UK engineering academics, has been developing an approach to this problem for some years, and in 1996 initiated its Quality Management Project, working with selected engineering departments and engineering institutions to develop a **quality management framework**. This framework aims to provide a basis for effective departmental quality management and improvement, while meeting the requirements of QAA assessment and university - level audit, accreditation and internal quality reviews.*

*To date, the main output of the project has been the EPC Specification for a Quality Framework at Departmental Level. The Specification aims to provide guidelines on what should be done to achieve quality where it counts, at departmental level. It was developed to help departments achieve good practice in the educational process and improve their quality performance. It also supports the assurance of quality and standards for the purpose of public accountability and the professional accreditation of courses. This paper describes the work of the project and outlines the quality management framework developed by the EPC.*

### 1. INTRODUCTION :

Despite the recent introduction of external assessment and audit, UK

universities remain fundamentally autonomous self regulation institutions, responsible for the quality and standards

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of their programmes and awards. In practice, responsibility for quality of education and academic standards is developed within institutions, primarily to the subject committees which provide that education, located within academic departments.

In recent years, self-regulation has been viewed increasingly as a quality management process, involving the monitoring, evaluation and management of conditions and activities that will lead to the provision of appropriate quality and standards. Guidelines on quality assurance are available for those designing in processes at university level (HEQC, 1996), **but little guidance has been available** concerning the department level quality management arrangements to fulfil institutional and external expectations and requirements.

Most UK engineering degree courses lead to exemption from the examination requirements of the engineering institutions, which are the professional bodies for engineers. Engineering departments are regularly visited (typically at 4-5 year intervals) by teams from the relevant institution, who accredit courses which meet the specified academic and other requirements. In addition to these accreditation visits, departments are individually assessed by the QAA, which aims to assess the quality of education, ensure value for money, encourage improvement and provide information to the public. On top of this external scrutiny of departments, most universities have internal quality review mechanisms which involve the preparation of assessments and reports, and periodic audits of departments.

The EPC, through its working parties, has been developing an approach to

quality management for some years (Tannock & Burge, 1994). To meet the needs of this external scrutiny the EPC Quality Management Project was set up to develop an approach, based on good practice, to support self regulation of the quality and standards of education. The rationale for a formal departmental quality management framework is based on the following needs:

- The need to take substantial measures at departmental level, which meet internal and external expectations and requirements for quality and standards.
- The need for department level quality policies, practices and procedures to be made explicit and accessible through a process of documenting intentions and evidencing process and outcomes.
- The need to support professionalism and promote a culture of critical self-evaluation and continuous improvement.

The EPC recognised that universities vary in the way of approach the management of academic quality issues and the level of responsibility for quality management which they develop to departments. The specification would therefore have to be interpreted according to individual circumstances. The starting points in the development of a quality management framework must be the existing policies, practices and procedures of the university and the department.

The EPC projects total funding of £80,000 is provided by the then Higher Education Quality Council (HEQC) which is now part of the QAA, the Higher Education Funding Council for England (HEFCE), the Engineering Council, the

royal Academy of Engineering, and four major UK engineering professional institutions.

- The Institution of Electrical Engineers
- The Institution of Civil Mechanical Engineers
- The Institution of Chemical Engineers

Six university engineering departments participated in the project :

- The University of Cambridge - Engineering
- Heriot-Watt University - Mechanical and Chemical Engineering
- The University of Northumbria at Newcastle - Electrical Engineering
- University of Portsmouth - Mechanical and Manufacturing Engineering
- The Queen's University of Belfast Chemical Engineering
- The University of Surrey - Civil Engineering

In the pilot study phase of the project, which took place in 1996, a draft specification for a quality management framework was prepared, and the participating departments implemented systems to meet its requirements for quality and standards. The first stage was a developmental audit, using a standard audit questionnaire. An initial self-evaluation using this audit tool was followed by an investigation visit to each department by the project team (for more details, see Jackson, et al, 1997) after which a report was prepared for each department.

After the initial evaluation, the project facilitators worked closely with departments to set up the required systems. At the same time, the facilitators

and project participants, assisted by experts from the HEQC and other project sponsors including the engineering institutions, worked together to refine the initial draft specification. As a result of this iterative process the EPC Specification was published in December 1996.

#### **THE EPC SPECIFICATION - A FRAMEWORK FOR THE MANAGEMENT OF QUALITY AND STANDARDS :**

The EPC Specification for a Quality Framework at Departmental Level (Tannock et, al, 1996), sets out a comprehensive standard of recommended practice covering a department's educational activities. It does so without adopting a prescriptive position in academic matters related to curriculum, teaching, learning or assessment, but instead focuses on the quality management and improvement processes which promote both academic excellence and educational effectiveness. Although the specification was developed for engineering department, care has been taken to ensure that its approach is readily applicable to all professional and vocational subject disciplines.

The EPC Quality Management project has pursued an approach informed by established good practice in commerce and industry. This approach is founded on the idea that quality and standards in HE provision can only be assured through the development of a quality - oriented culture within universities, and particularly within the operating units which are the academic departments. Such a culture must be founded on appropriate processes, procedures and practices. Quality for HE lies primarily on the hands of those who design, develop, deliver and review courses.

A quality management framework is

the means by which a department satisfies itself that the quality of education it provides is being maintained and improved, and appropriate academic standards are achieved. A quality framework in the UK must also be designed to meet the challenges posed by external scrutiny such as QAA assessment, university audit and professional accreditation, as it provides evidence to demonstrate that the expectations of the university and relevant external bodies in respect of quality and standards are being met. There are many ways in which such various requirements can be combined - the task is to combine them in the most effective, creative and productive manner.

The EPC specification identifies the elements of a departmental quality management framework as follows :

- Policy and objectives
- Organisation for Quality
- Quality assurance system and documentation
- Quality improvement
- Integration and externality
- Academic standards

A department which adopts the Specification is expected to tackle each of these areas in an effective and explicit manner. The following sections outline the elements of the quality management framework.

#### **POLICY AND OBJECTIVES :**

The departmental framework should be underpinned by an agreed statement articulating the values, policy and objectives of the department concerning the maintenance and improvement of the quality of education and research training that it provides.

It is important to ensure that the policies and objectives are relevant to the stated policy of the university, and consonant with the strategy, circumstances and environment of the department. The policy and objectives should be made available to all staff and students.

#### **ORGANISATION FOR QUALITY :**

Responsibility for maintaining and improving the quality of education provided rests with the department and also with each individual through their own professional and academic standards. The essence of an effective quality management framework is that it supports the individual and department in discharging their responsibilities and planning for improvement.

To achieve this, it is necessary to define clearly the responsibility, authority and interrelation of all staff who undertake work affecting the quality of education and of committees which oversee quality.

The organization for quality within the department must take account of and support the quality - related structures and processes operating at a more general level within the university. There are many ways of coordinating the development and maintenance of a quality system, for example the identification of a member of staff with specific responsibility and authority, or the sharing of responsibility between members of a group or quality committee. Whichever route is adopted, resource requirements should be identified, and adequate resources provided to support the implementation and continuing management of the quality management framework.

### **QUALITY ASSURANCE SYSTEM AND DOCUMENTATION :**

Quality management to support a complex professional service like higher educational must incorporate specific operational elements of quality assurance and control, together referred to as the quality assurance system or simply 'quality system'. The quality system exists in the context of the policy and structures of the quality framework, and operates to control quality and standards throughout the educational process and to support staff in achieving the department's quality policy and objectives. Specific system elements and requirements are outlined in the specifications as listed in the next section.

The assembly and documentation of the quality system by means of a Quality Manual is an important part of the process of building, consolidating and clarifying the quality management framework. By describing the framework in a single document, a department can show that its activities reflect a coherent and integrated quality strategy. As well as detailing the specific elements of the quality system, the manual should describe the broader context of the quality management framework, including policy, objectives, organization, quality important, integration and academic standards.

### **QUALITY IMPROVEMENT :**

A key role of the quality management framework is to enable and support a process of continuous quality improvement. Hence the department should establish formal measures as part of the quality system, to support an ongoing improvement process aimed at all departmental activities, including the quality system itself.

Effective improvement requires timely and objective information about actual and potential quality failures and their causes, and results in decisive action to prevent their occurrence or recurrence. There are many possible mechanisms for quality improvement and each department will need to develop approaches best suited to its own circumstances. Regular review process are proposed, supported by rapid-response mechanisms to resolve any shortcoming as they arise.

Formal systems should be supplemented by efforts to ensure that all staff are aware of the constant need for individual and collective efforts towards critical self-assessment and improvement of the quality of education.

### **INTEGRATION AND EXTERNALITY :**

The quality of education provided by a department depends upon effective integration of the departmental quality framework in a context provided by university quality management systems, external quality assessment and the requirements of the academic or professional discipline. There are three dimensions to this aspect of the specification.

- a) Internal vertical relationships which link the department to the faculty or school, the university and the peer networks outside the disciplines (e.g. internal quality audit, validation and course review processes).
- b) Internal horizontal relationships which link the department to other parts of the university which have responsibilities for the quality of education, support the students learning experience (e.g. other departments, colleges or service providers) or provide essential



administrative services (e.g. Registry)

- c) External relationships which link the department to peer and (where appropriate) practitioner networks in its discipline, and which support the department in maintaining and enhancing the quality and standards of education (e.g. professional body accreditors, teaching quality assessment, external inputs to programme validation or departmental review).

#### **ACADEMIC STANDARDS :**

Recent changes in UK universities, including the adoption of modular course structure and semesters, have led to concerns that traditional approaches to academic standards, based on collective judgements against implicit criteria, are of variable effectiveness. The subject community within a department is normally the operational level at which responsibility for academic standards is exercised. It is therefore essential that the department addresses these issues within its quality management framework, by establishing conditions conducive to appropriate standards in the context of the entire educational process.

Consideration of academic standards must address two interrelated aspects, the construction of standards and the application of standards in the assessment of student learning. The first is a complex iterative process involving the individual and collective scholarship and expertise of academic staff, professional standards and the external relationships described above. This process is fundamental to the quality of education as it underpins the design of programmes which enable the described standards to be achieved. At departmental level, construction of academic standards

should include :

- a) Identification of explicit reference points benchmarks for the construction of academic standards including comparability with similar programmes elsewhere (through programme validation, the external examiner systems and other mechanisms) and, where appropriate, acknowledgement of the role of subject associations, professional / statutory bodies and employers in the setting of standards.
- b) Clear definition and articulation of academic standards in terms of the level of award and stage of study, taking into account the aims and learning objectives of the overall programme of study.
- c) Communication to students of the standards expected of them, and their own responsibilities in fulfilling them.
- d) Provision of opportunities for all staff to develop and maintain an appreciation of the expected standards, the processes by which students achieve them, and good practice in the way this achievement is assessed.

The practical application of standards to student assessment involves staff expertise in assessing levels of student performance supported by the external examiner system, which also serves to help calibrate and confirm standards. Academic standards are applied within explicit regulatory settings designed to support the consistency and reliability of academic practice and judgements. The nature of this regulation varies between universities, but typically it controls the architecture of the curriculum (e.g. the size, type, level and number of modules, how they are organized into programmes of study) and the various operations of

examination boards (e.g. rules for students progression, the award of credit, honours classification.)

#### **QUALITY MANAGEMENT OF THE EDUCATION PROCESS :**

The Specification also covers the quality assurance of the educational process, identifying good practice in all significant activities. A concise set of expectations is presented for the practices, procedures and activities required to support quality, professionalism and appropriate academic standards.

Practices for the management of quality and academic standards are undertaken in the context of the educational process, which can be conceptualized as a cycle of activities, the key stages of which include planning and design, delivery management and assessment, review and evaluation of activities and performance, and planning for improvement. This cycle of activities lies at the heart of the quality management framework. The following areas are included in the specification.

1. Design of Programmes of Study
2. Admission and Entry Standards
3. Delivery and Management of Programmes of Study
4. Student Guidance and Support
5. Service Support of Programmes of Study
6. Staff - Student Communication
7. Problem Reporting and Corrective Action.
8. Assessment and Academic Standards
9. Research Supervision
10. Review of Quality and Standards
  - (a) Review of Programme elements.
  - (b) Review of Programme of Study.

#### **11. Collaborative Arrangements**

In addition, staffing and control of the quality management framework itself are addressed by the Specification :

#### **12. Staffing**

(a) Recruitment, Induction and Probation

(b) Staff Appraisal and Development

#### **13. Control of the Quality Management Framework**

(a) Documents Control

(b) Records and Evidence

(c) Review of the Quality Management Framework.

The compilation and maintenance of records which demonstrate the establishment and maintenance of systems to plan, control and validate the design and review of programmes of study, staff development, admission policy, etc. is emphasized in all relevant sections of the Specification.

#### **RESULTS IN THE PARTICIPATING DEPARTMENTS :**

All six participating departments set up quality management systems according to the specification, yet each system was different, reflecting the various organizational and management approaches taken up by the universities and departments concerned. The two new universities, Portsmouth and Northumbria, had in the past (before 1992) been polytechnics regulated by the Council for National Academic Awards (CNAA). Polytechnics had formal management systems required by the CNAA to regulate quality and standards of education. Since becoming universities, they had (like most of the new universities) started to diverge from the CNAA standard systems, but both had comprehensive quality manuals at

university level, institutionwide control processes for quality and standards. This limited the scope for systems design at departmental level, but in both universities the initial audit process identified gaps in the university systems for which departmental processes were designed and implemented. At Portsmouth, the EPC project helped to start a university-wide development process to provide all quality documentation on-line via the campus computer network.

The older universities were more disparate as regards central systems. Since the advent of HEQC Audit and HEFCE Teaching Quality Assessment in the early 1990s, most of the older universities have felt it necessary to enhance their traditional systems for management of quality and standards. Previously, there were few formal quality management processes at university level, but all the institutions involved were now in the process of developing systems. The maturity and effectiveness of these systems was variable. In each case however, departmental systems were established which integrated with existing central systems. At Cambridge, where the Engineering Department is very large and organized in an unconventional manner, the initial quality systems implementation covered only the first year of the course. At Surrey, the quality management documentation formed part of a comprehensive administrative manual. At Queens Belfast, the documentation was included in an expanded Staff Handbook, while at Heriot-Watt a Standard Quality Manual was developed.

#### CONCLUSIONS :

The EPC specification has been widely distributed in the UK and other

countries, and many engineering departments have reviewed their quality arrangements in the light of its requirements. The EPC approach reinforces the part which the department plays in university quality management strategies. It emphasises the importance of ensuring that department level quality policies, practices and procedure are made explicit and accessible through a process of documenting intentions and evidencing process and outcomes. Just as in manufacturing industry, where the ISO 9000 standards have shown their value, documentation of the quality system by means of a Quality Manual as an important part of the process of building, consolidating and clarifying the quality management framework.

Construction of academic standards is also made clear at departmental level, including, identification of explicit benchmarks, comparability with similar programmes elsewhere (through programme validation, external examiners, etc.) and acknowledgement of the role of subject associations, professional statutory bodies and employers.

Those implementing or enhancing a departmental quality management framework may use the EPC approach to help them identify aspects of their arrangements which are in need of further development. A workbook based on the Specification is in preparation to facilitate the self-evaluation process. The Specification provides a valuable codifying tool, although reflective practitioners / departments would probably operate in this fashion anyway. Departments may use what they wished from this approach, and modify it to their own needs.

After the publication of the EPC



Quality Project has moved into a new phase. Central issues in UK Higher Education are academic standards and assessment. A benchmarking project for assessment and academic standards has been instituted among the participating departments at Lancaster and Nottingham universities. A comprehensive and searching questionnaire on academic standards, assessment and their interrelationship was prepared by QAA staff and completed by the participants, to illuminate key issues and identify best practice. The results of this study will be published in due course.

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### QUALITY EDUCATION :

Quality education is the continuous improvement of systems to enable the optimum state of personal, social, physical and intellectual development of each individual which will result in society and colleague loyalty, now and in future.

from : "TQM for Schools" -

by : M. S. Greenwood & H. J. Gaunt