

SPAIN
THE QUALITY SYSTEM AT UNIVERSITAT POLITÈCNICA DE CATALUNYA (UPC)

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1. INTRODUCTION

The IMHE programme of the OECD has developed a study project on mechanisms of quality management, quality assessment and the decision making process in institutions of higher education.

This paper forms part of this project, and describes the experience of the Universitat Politècnica de Catalunya in the construction of its own quality system.

2. HIGHER EDUCATION: THE CONTEXT

In all developed countries, the university system has undergone a major qualitative and quantitative change in recent years. In society as a whole and in the university community there is an increasing demand for improvements in the overall quality of university institutions.

In addition to the effort the university must make to fulfil the high demands that it makes on itself, it is important to take into account certain elements that justify this approach.

- A future slackening of demographic pressure, in the wake of a decade of vigorous quantitative growth;
- Budgetary stagnation;
- a trend towards higher levels of self-financing;
- selective funding according to quality criteria;
- greater direct demands from the customers of the service we provide;
- increasing needs for specialised training in an advanced socio-economic environment;
- more competition, with the incorporation of new public and private universities and the diversification of higher education structures;
- the phenomenon of the internationalisation of education and science.

In this context, maintaining and improving the standards of the service provided in a much more restrictive economic environment will therefore lead to a more efficient overall management of the university. Furthermore, in this more open and competitive environment, in order to face the challenge of providing a service capable of meeting the demands of a more advanced society and to guarantee its support, the university must pursue a strategy of prominence through the quality of its service.

2.1. The Spanish University system

The University Reform Act of 1983 laid down the characteristics of what we now know as the Spanish university system.

- basic public universities with independent legal status (90 per cent) or private universities (10 per cent);
- universities are governed according to the principle of university autonomy, by their own by-laws;
- approximately 80 per cent public funding;
- most staff is contracted according to the civil servant model;
- government acts on two levels: State or central government, and regional or autonomous government;
- central government establishes the general legal framework regulating the university system, the range of official degrees and the capacity for homologating curricula;
- regional or autonomous government basically assumes responsibility for the planning of university development within its geographical boundaries and the funding of the universities.

The University System Board was set up to co-ordinate university policy, with the representation of the rectors of all the Spanish universities and the central and regional governments.

It should be noted that in recent years the decentralisation process implemented by central government due to the development of the State of the autonomous regions has resulted in the universities being ceded to their respective autonomous regions. Another important factor has been the appearance of the first private universities following the passing of the law empowering them to offer homologated degrees, in 1991.

In general terms, the university funding system obeys a basically incrementalist budgetary rationale, according to which the budget of any given year is drafted on the basis of the general increment of the budget of the previous year.

However, it should be stressed that, as mentioned above, the funding of the universities is the responsibility of the regional authorities. The situation is not the same in all autonomous regions; thus, in Catalonia, as well as a base budget designed to cover current expenditure, there exists a certain amount of power to establish budget programmes with specific objectives, while in the Valencian region a model for funding has been developed on the basis of objective needs and results achieved, and in the Canaries a model has been implemented that is new to Spain, linking the funding

of each university to desired objectives by means of a system of programme contracts. We consider these to be the most notable examples.

As for mechanisms for assessing and ensuring quality in universities, there is no legal requisite for their application, although in recent years considerable progress has been made in this direction.

- In 1993 the University System Board introduced the Experimental Programme for Institutional Quality Assessment in Universities. The aim of the project was to carry out a methodological test to assess the quality of university teaching, research and management. Sixteen universities, including UPC, took part in the scheme, and twelve degree programmes were assessed.
- The European Pilot Scheme for Quality Assessment in Higher Education was conducted from November 1994 to June 1995 with similar ends. Four Spanish universities, one of them UPC, took part in the project, which was co-ordinated by the University System Board and assessed two degree programmes.
- In November 1995, the National Quality Assessment Plan for the Spanish University System was made public. It has a duration of five years, although it is subject to annual revision, and is implemented through the yearly convening of institutional assessment projects. The National Plan establishes a mixed method encompassing self-assessment and external assessment, and sets the program as the minimum unit of assessment.

One important feature is that the universities participating in this programme do so on a voluntary basis.

- The National Plan adopts, therefore, the methodology for quality assessment commonly found in those European countries with which we have most contact. In very general terms, the steps involved in this process are as follows: Systematic information on the unit to be assessed is gathered by means of predefined assessment protocols which also incorporate performance indicators and statistical data.
- A self-assessment report is conducted by the unit to be assessed.
- This self-assessment is compared with the results of a visit by a group of outside experts.
- The final synthetic report is drafted and passed.
- Decisions are made by the institution concerned regarding the introduction of proposals for improvements on the basis of the assessment.

Furthermore, the National Plan involves two distinct levels: general and thematic assessment. The latter deals with one degree programme or a group of programmes in the same scientific or educational field, while general assessment considers the university as a whole.

2.2. The Universitat Politècnica de Catalunya (UPC)

The Universitat Politècnica de Catalunya was created in 1971 by grouping together the various technical colleges that existed then in and around Barcelona. It focuses on teaching and research in the fields of architecture, engineering and the applied sciences.

As a result of the implementation of the University Reform Act, today UPC has a matrix-type structure of schools and departments, thus enabling it to respond to the twofold objective of teaching and research, spread over six university campuses throughout Catalonia. The headquarters of the University is in Barcelona.

Fifteen schools (nine specialised schools and faculties and six technical colleges) actually belong to UPC; in addition, there are seven associated private schools. In all, the University organises and manages 57 degree and diploma courses for which a total of 37 000 students are enrolled at present.

The 38 university departments and five research institutes organise and teach the undergraduate and postgraduate courses. There are some 1 500 doctorate students and 4 500 students on postgraduate training programmes and continuous training. Each unit also conducts research and technology transfer in its particular knowledge area.

The University has a Technology Transfer Centre for promoting and managing technology transfer, with an annual turnover in excess of Ptas 4 000m, and a foundation, the Polytechnic Foundation of Catalonia, for promoting and managing continuous training activities.

The University has a teaching and research staff of 2200 (70 per cent of them full-time) and administration and service personnel totalling over 1 000 people. The liquidated budget for 1996 was in the region of Ptas 27 000m.

3. THE QUALITY SYSTEM AT UPC

In recent years the Universitat Politècnica de Catalunya has given high priority to improving the quality of its activities, *i.e.*, teaching, research and services, from three different viewpoints: materials, human resources and methodology.

As the supreme governing body of the University, the UPC Senate has played a leading role in this process, by discussing and approving the documents on which the quality system at UPC is based.

- The document “**Assessment, Decision Making and Resource Allocation**”, in which the University explicitly stated its policy decision to set up mechanisms for internal assessment with the aim of improving the quality of its activities, was debated and passed in July 1993.
- In February 1995, the Senate passed the “**UPC Strategic Plan**”, which, on the basis of the definition of the University’s mission -- “Quality at the Service of Society” -- and its strategic lines, lays down the plan of action for the University for the 1995-1998 four-year period.
- In May 1996, the Senate gave its approval to the document “**Institutional Assessment and Quality Improvement**”, which stressed the importance of structuring the model for the internal assessment of UPC and participating in the Quality Assessment Plan for Universities organised by the University System Board.
- In March 1997, the Senate passed the document “**Framework for Quality at UPC**”, thus completing and consolidating the quality system. The focus is primarily on mechanisms that encourage the participation of the university community in the

introduction of improvements. Also approved was the creation of the UPC Quality Board, a body set up to promote and guarantee the co-ordination and coherence of the quality system at UPC.

As the above shows, this process has been developing for some time at the University. A quality system for UPC has been built on a threefold of ASSESSMENT and PLANNING aimed at IMPROVEMENT INITIATIVES, and is co-ordinated and promoted by the QUALITY BOARD.

In diagrammatic form:



3.1. Planning at three levels

Since its presentation to the Senate on 27th February 1995, the **Strategic Plan** has been the tool that provides a framework for planning. It constitutes a point of departure, and is implemented through the sectorial plans and the strategic plans of the structural units.

3.1.1. Institutional level: The UPC strategic plan

UPC has been engaged in a process of strategic planning since 1995, when it established its mission, strategic lines and improvement objectives to be pursued as an institution of higher education wishing to find a place in the 21st century.

The mission can be synthesised in the following leit motif: *QUALITY AT THE SERVICE OF SOCIETY* and is also provided with a complementary definition that specifies and develops it further: *to serve the needs of society by encouraging enterprise in the teaching and research units, thus cultivating technical, scientific and artistic excellence.*

It also includes a “vision” of the future, which outlines:

- changes in the students typology;
- need to excel in the research field;
- continuously adjusting to the external requirements;
- changes in the funding system.

This mission and this vision gives rise to the University’s main strategic lines of development:

- to meet the needs and demands of society by raising standards of quality and excellence;
- to step up involvement in society and institutions, and also relations with the technological and scientific community;
- to improve the quality of life of the university community and its identification with the objectives of UPC;
- to increase the efficiency of the University’s internal organisation.

Within these strategic lines, 32 lines of action and 117 concrete measures have been defined.

This general framework is used to develop all UPC’s policies and sectorial plans in its various different areas: regulated teaching, research, transfer of technology and know-how, training, services, university extension, internal management and organisation, etc. At the same time, each of the University’s structural units proposes its own process of strategic planning, taking into account its own situation, that of its immediate environment, and the future demands of society, with the ultimate aim of improving academic quality to serve society.

3.1.2. Sectorial level: sectorial plans

These establish the sectorial policies and operational plans that help to develop the major lines established by the Strategic Plan. The following sectorial plans have been passed and the units must take it into consideration when drafting their own strategic plans:

- The **academic staff policy** sets lines of action regarding the academic staff’s professional career, contractual basis (full-time or part-time) and staff structure.
- The **administration and service personnel policy** embraces all those human resources management tools either being applied or scheduled to be applied to this personnel group. More specifically, it lays down guidelines for initiatives regarding personnel selection, training, assessment and promotion and defines the job classification.

- The **international relations plan** seeks to consolidate UPC's international projection with regard to teaching, research, technology transfer, services, management and Cupertino..
- The **Escher programme** for initiatives in the UPC libraries for the years 1995 to 1999 builds on the foundations laid by the earlier Leibniz programme. It places priority on equipping the libraries for use as self-learning centres.
- The **health and safety plan** involves ensuring that work places comply with safety regulations and that facilities and equipment meet standards.
- The **undergraduate academic programme** establishes, through an agreement with the Catalan government, the programme degrees to be introduced and the number of places on courses for the period 1996-2000.
- The **Univers programme** aims to integrate the range of sports, culture and leisure activities available at the University, together with discounts for its members.
- The **doctorate reform framework** establishes lines of action aimed at restructuring the doctorate programmes and promoting these studies.
- The **environment plan** is a horizontal plan affecting the entirety of the University's activities. It gives structure to the set of measures designed to make the University environmentally friendly, and integrates the issue into the range of available training, research lines and UPC's day-to-day work environment.
- The **research activity promotion plan** is currently being devised to create mechanisms for analysing the demand for research and technology transfer, set up a research promotion unit, develop active policies aimed at making UPC's research capacity widely known, and provide internal counselling with a view to maximising opportunities for outside funding.
- The **language quality improvement programme** sets objectives and lines of action in this field, with particular attention to the normalisation of the Catalan language.

Initiatives to be introduced in 1997 include a **communication plan**, aimed at giving impetus both to the external projection of UPC and to internal communication, and a **curriculum improvement framework**, aimed at revising and extending the curricular reform that started five years ago at UPC.

3.1.3. Unit level: strategic planning of the structural units

The UPC Strategic Plan and the sectorial plans developing it in each of the University's structural units (schools, departments and research institutes) takes on concrete form through further strategic planning by the management of each unit, autonomously but coinciding with the previously defined guidelines.

This is, therefore, the stage at which the process of strategic planning at UPC is given its final form. The following initiatives have been taken on this level:

- July 1995. The process of strategic planning was started in the university departments, following the approval of a framework document for its implementation. By March 1997, four plans had been passed and a further eight were under negotiation with the Rector and Vice-Rectors (out of a total of 38 departments).
- July 1996. The process of strategic planning was started in the university schools, following the approval of a framework document for its implementation. By March 1997, one plan was being finalised and a further three were under negotiation with the Rector and Vice-Rectors (out of a total of 15 schools).
- The process of strategic planning is due to start in the university institutes in July 1997.

The most significant initiatives carried out within the three lines of action are shown in the table below, which shows a four-years guide planning, a ten-based distribution.

PLANNING		1995	1996	1997	1998
INSTITUTIONAL STRATEGIC PLAN AND MONITORING	UPC strategic plan: February 1995 First report: May 1996 Second report: March 1997 Strategic Planning Committee	****	**	**	**
SECTORIAL POLICIES AND PLANS	Academic staff policy Administration and service personnel policy International relations Escher plan for libraries Work health and safety plan Undergraduate academic programming Univers programme Doctorate reform framework Information systems plan Environment plan Research promotion Language quality improvement plan Communication plan Curriculum improvement framework	***	****	**	*
STRATEGIC PLANS FOR THE STRUCTURAL UNITS	Framework documents for departments Framework documents for schools Five plans passed Eight plans at discussion stage		**	****	****

3.2. Implementation of improvements at three levels

Careful planning and thorough assessment may be pointless exercises unless they are accompanied by effective consequences in the shape of the introduction of concrete improvements in the service provided, the correction of shortcomings and the promotion of those areas of excellence that are detected. This change for the better depends ultimately on the direct agents of the service provided (the academic staff and administration and service personnel), but it requires a favourable environment and the support of the units responsible for its planning and organisation (schools, departments, university institutes and services) and the University as a whole.

In recent years, many initiatives have been taken in this area at the University. They have taken the form both of measures on an individual basis and decisions by the University's central governing bodies, although in the latter case, much as any progress made is positive in itself, it is essential to ensure the coherence of the measures, in accordance with the previous assessment and planning.

In this section it is also important to distinguish between across-the-board proposals for improvements (the institutional plan and the sectorial programmes) and those initiatives successfully introduced by the various units.

3.2.1. Institutional level: Encouraging improvements

On a more general level, the University is studying the possibility of encouraging improvement initiatives by stepping up involvement in the introduction of improvements by the whole UPC community, by the following means:

- promotion the dynamics of the improvement groups to the entirety of the activities carried out at the University;
- assurance of quality conditions, with a analysis of the main characteristics of improvements;
- a practical and flexible system for gathering information about the various improvement initiatives under way in the units, with a view to facilitating internal benchmarking;
- network connection, to know universities of Spanish, Europe and America, and the enterprises compromised in the Quality improvement;
- management team reorganisation, in order to be able to work in planning, to encourage improvement initiative and to make a continuous control and a final assessment;
- systematisation of main processes, and approving the handbooks on which the task is based;
- personnel of administration and services training;
- sensibilisation activities, thus conferences, workshops and another events, for example in the European Week of Quality.

3.2.2. Sectorial level: Sectorial improvements

On an institutional level, the University has devised a programme budget which objectivises the priorities, resource allocation and monitoring of the progress of the various sectorial improvement programmes.

3.2.3. Unit level: Improvements on a structural units

On the level of the structural units, a scheme has been introduced for establishing programme contracts between the unit concerned and the University's central governing body. The idea is to give backing to the proposed improvement plans on the basis of the results of the assessment carried out and the respective strategic plans. With this formula, the allocation of resources is linked to the accomplishment of the agreed objectives. The initiatives discussed above are summarised in the following table which shows a four-years guide planning, a ten-based distribution.

INTRODUCTION OF IMPROVEMENTS		1995	1996	1997	1998
IMPROVEMENT AND MONITORING PLAN	Promotion of improvement groups Assurance of quality conditions Diffusion of internal and external improvement initiatives: benchmarking Network connection Management team reorganization Processes systematization Personnel training Sensibilisation activities	**	***	***	**
SECTORIAL IMPROVEMENT PROGRAMMES	BUDGET PROGRAMMES Support programme for schools Support programme for depts. and institutes Escher programme for libraries Programme for general functioning and investments Computer programme International relations programme University community services programme Communication programme Health and safety programme	**	***	***	**
STRUCTURAL UNIT IMPROVEMENT PLANS	Agreements for developing the strategic plans Pilot schemes with quality groups	*	**	***	****

3.3. Assessment at three levels

For some time UPC has been concerned with assessing its activities in a number of areas, increasingly cultivating a philosophy of accounting for its actions.

The University began by developing mechanisms for sectorial assessment. More recently, its experience of various models of institutional assessment has been used to tackle assessment at the more general levels of units and the whole University.

Thus, UPC's model for assessment is based on systematically implemented sectorial assessment initiatives (in particular, the use of indicators) and assessments in a broader framework for the University as a whole, incorporating the methodology of external assessment processes.

The initiatives taken in each of these directions are outlined briefly below.

3.3.1. *Institutional level: Assessment on a institutional basis*

We are working on a draft report for the university assessment, according to the European scheme of Quality and the European Foundation for Quality Management (EFQM) method. Previously these instruments were used by the governing team, which realised an auto-assessment exercise.

3.3.2. *Sectorial level: Assessment on a sectorial basis*

From the governing units we have also assumed the encouragement of the different sectorial assessments.

- **Assessment of research activity** follows a highly developed model using parameters that take into account the results of scientific activity (work published in periodicals and books, participation in conferences, supervision of doctoral theses, etc.), duly weighted to provide an assessment of activity at the levels of individuals, research groups and structural units.
- **Questionnaires** on teaching and the functioning of the subjects are carried out on all students twice a year (once per semester).
- The **administration and service personnel** are assessed once a year in order to provide a tool for the improvement and professionalisation of management. To date, this has been done on a mixed basis involving assessment by factors and by objectives, but the system is currently being redesigned.
- Postgraduate **continuous training programmes** are also assessed by means of student questionnaires, particularly since the creation of the Polytechnic Foundation of Catalonia.
- A system of **quantitative indicators** for monitoring and assessing the functioning of teaching activity has been passed by the Senate.

- The services we provide (libraries, catering services, publications and many others) are assessed for **user satisfaction** by means of questionnaires carried out on users, sporadically in some cases and systematically in others.
- In connection with the above, the possibility is currently being studied of introducing a mechanism whereby systematic and periodic information could be provided on the **opinion of UPC graduates** with regard to the training they have received and their degree of integration in the job market.
- In order to assess the economical management, the Social Council demands an annual audit of the UPC accounts and an “Internal Control Report” is realised to analyse the efficacy and the efficiency management degree.

3.3.3. Unit level: Assessment on a structural units

UPC is fully aware of the growing importance of university assessment and quality and the interest shown in this direction by government bodies; it has participated in the experimental assessment processes for Spanish universities, which have since given rise to the present university system quality assessment scheme devised by the Spanish government’s University System Board and the Catalan government’s Universities and Research Commission. Specifically, UPC has taken part in the following projects.

- The University System Board Experimental Assessment Programme on teaching, research, management and decision making mechanisms, started in 1993. Three UPC programs and six departments participated in the programme.
- The European Pilot Scheme for Quality Assessment in Higher Education, co-ordinated for similar purposes by the University System Board from November 1994 to June 1995. Four Spanish universities took part in the project, and two degrees were assessed. One of the institutions involved was UPC, with the degree in Telecommunications Engineering.

In all the above cases the University was moved to participate by its interest in becoming acquainted with, and acquiring know-how on, the institutional assessment processes proposed by various different university systems, with a view to adapting them for use within UPC.

The University System Board is currently engaged in promoting the five-year National Plan for the Quality Assessment of the Spanish University System. Seven UPC schools, two departments and one service have participated in its first edition (for the 1996-97 academic year), although the University plans to assess all its schools over the next three years.

As a complement to the above, the quality management assessment protocol promoted for the university environment by the European Foundation for Quality Management (EFQM) has been adapted for internal use and applied in self-assessment sessions in eight UPC schools.

At the moment we are full-working in order to achieve an ISO-9001 certificate in the area of a university school teaching.

The initiatives discussed above are summarised in the following table which shows a four-years planning, a ten-based distribution.

ASSESSMENT		1995	1996	1997	1998
INSTITUTIONAL ASSESSMENT	Draft report for the university assessment Encouragement of the sectorial assessment	**	***	***	**
TOOLS FOR SECTORIAL ASSESSMENT	Student questionnaires on teaching Parameters for research assessment Assessment of the administration and service personnel Student questionnaires on the functioning of the subjects Quantitative indicators for monitoring teaching activity Questionnaire on the opinions of graduates Annual audit and "Internal Control Report"	**	****	***	*
ASSESSMENT ON A STRUCTURAL UNITS	University System Board Experimental Plan: 1993-94 European Pilot Scheme: 1995 1996 assessment plan: 7 schools, 2 departments 1 service	*	***	***	***

4. QUALITY MANAGEMENT, QUALITY ASSESSMENT AND MECHANISMS FOR RESOURCE ALLOCATION

UPC has devised the quality management system described above. It ensures that the University acts within the circle of planning, the implementation of the scheduled improvements and assessment.

The role of the Quality Board is very important in order to make the coherence of these elements and their interrelation must be guaranteed; in no instance should they be isolated, inconsequential measures:

- The initiatives that follow on from assessment form an essential part of quality improvement. Specific improvement plans must be devised and integrated into the strategic planning of each unit.
- The strategic plan passed for each unit must form part of a set of measures with a time schedule so that its fulfilment can be assessed. There should also be a mutual commitment between the governing body of the University and the unit concerned regarding the fulfilment of specific objectives.

- The various initiatives must be carried out as scheduled, and assessed according to the objectives. The results obtained should serve as both positive and negative feedback for the process when the objectives fail to be reached.

In this respect, there is one very clear indicator which provides insight into how important assessment can be for the University: its relation with mechanisms for resource allocation.

One of the most fundamental decision making processes in the governing of any institution is the process of drafting and passing the budget. In order to guarantee coherence between this element and the rest of the initiatives undertaken by the University towards quality improvement, this process had to be redefined. At the University, resource allocation has traditionally been a very technical process in which the discussion of objectives focused on a small slice of the total budget, and the major items accounting for the bulk of the University's expenditure were taken for granted.

The budget should be a reflection, in economic terms, of the decisions reached regarding the functioning of the University. For this reason it was decided that as from 1995 the entire budget would be divided into programmes dealing not only with what is spent, but also what it is spent on. Each programme has a predefined mission, objectives, activities by means of which these objectives are to be reached, programme directors, indicators for analysing how close the objectives are to being reached, and finally the amount of money required. The budget programmes are organised to coincide with the lines of the Strategic Plan, and the indicators for assessing the fulfilment of objectives correspond to the established sectorial assessment programmes.

Internally, the budget reflects the agreements reached with the units in the framework of their respective strategic plans; these agreements tend to effect the items of expenditure on personnel and equipment. The financial resources for decentralised current expenditure of the order of 1 per cent of the total budget, are internally distributed to the various units by means of a set of criteria for resource allocation on the basis of the results they obtain. Thus, out of a total of Ptas 340m for this item, around Ptas 200m (approximately 12.5m Ecus) is allocated on the basis of output indicators (number of graduates, number of doctoral theses, revenue from technology transfer, research results, etc.).

In summary, the links between the processes of planning and assessment and mechanisms for resource allocation are guaranteed by the **programme budget**, which integrates objectives and resources. With regard to the units, there are pluriannual agreements (primarily concerning investments and personnel) based on the strategic planning of the unit concerned, and allocations for current expenditure items on the basis of annual results.

After this restructuring exercise the resources allocation according to the results it has been possible to deal with the Education authorities of the Autonomous Government the chance to sign a programme-contract which is by now quite finished where it ties the general funding of the university to the limited number of goals considered the key-ones of the institution.

As a final thought we want to say that the Quality System at UPC is still very young. It is like a child, a big promise but everything to prove. We believe that the parts of it are well set and the gears work. Time will say whether all this will help us to improve the quality of our university, which is in fact our final goal. So we hope.