

Strengths and obstacles for quality assurance in the European Higher Education Area: The Spanish case

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Abstract

Quality assurance and accreditation in higher education are a priority aim in the convergence process to the European Higher Education Area (EHEA). Although the majority of European universities are working around these issues, there exist diverse tensions between the national legislation, accreditation and quality assurance, both in internal and external contexts. Spanish Higher Education Institutions must ensure the fulfillment of the goals related to their different degree programs, in a context of continuous improvement. This paper presents the evolution, some examples and the more recent trends related to quality assurance and accreditation in Spain. It comments some instruments that have been developed by the National Agency for Quality Assessment and Accreditation of Spain (ANECA), like the guidelines developed in the AUDIT program whose purpose is to provide guidance in designing internal quality assurance systems.

Introduction

Quality and accreditation of higher education have proven to be at the heart of the setting up of a European Higher Education Area (EHEA); they are considered as an international determinant factor of the European competitiveness and mobility. The principal idea - repeated persistently as slogan- is that the European educative and training become a “world quality reference by 2010” [1]

In the London Communiqué it affirms: “We see the overarching Framework for Qualifications of the EHEA, which we agreed in Bergen, as a central element of the promotion of European higher education in a global context” [2]. The Council of the European Union, in its *Resolution on modernising universities for Europe's competitiveness in a global knowledge economy* (2007) has reaffirmed:

- The need to advance in bringing about the modernisation of Europe's universities as a key element of Europe's drive to create a knowledge-based society and economy and improve its competitiveness;
- The need for universities to have sufficient autonomy, better governance and accountability in their structures to face new societal needs and to enable them to increase and diversify their sources of public and private funding in order to reduce the funding gap with the European Union's main competitors;
- The importance of Quality Assurance as a powerful driver of change in higher education;
- The role of universities, through education, research and innovation, in the transfer of knowledge to the economy and society as a main contribution to Europe's competitiveness and the need for closer cooperation between academia and the world of enterprise.

In the same document the *Council of the European Union* invites the member States to promote the internationalization of higher education institutions by encouraging quality assurance through independent evaluation and peer review of universities, enhancing mobility, promoting the use of joint and double degrees and facilitating recognition of qualifications and periods of study [3].

In addition, the current structural and curriculum reform provide an opportunity for universities to reflect upon management practices and to review programs and teaching methods with the aim of ensuring their

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quality. In this sense, putting competences and learning outcomes at the heart of the academic activity means overhauling the conceptual, procedural and curricular architecture of higher education [4]-[5]. Some European colleges and universities have undergone important transformations in response to this movement toward competency-based learning, while others still maintain a traditional curriculum packaged in standard delivery formats. Both learning outcomes and level descriptors were put firmly on the agenda for signatories to the Bologna Process by the Berlin Communiqué of 2003, where “Ministers encourage the member states to elaborate a framework of comparable and compatible qualifications for their higher education systems, which should seek to describe qualifications in terms of workload, level, learning outcomes, competences and profile” [6]. They stressed the need to develop mutually shared criteria and methodologies on quality assurance and also indicated that consistent with the principle of institutional autonomy, the primary responsibility for quality assurance in higher education lies with each institution itself and this provides the basis for real accountability of the academic system within the national quality framework. But in Spain, as in several countries, there is a high risk that concepts and tools such as student-centred learning, learning outcomes and modularization in curricula development, and the link to European Credit Transfer System (ECTS) and the Diploma Supplement are implemented haphazardly to comply with existing regulation, without a deep understanding of their pedagogical function [5]. In this paper, it presents the evolution of quality and accreditation issues along the Bologna’s process and the changes in the Spanish context within the European Higher Education Framework, showing the more recent trends and programs related to quality assurance and accreditation considering the formal policies and the National Agency for Quality Assessment and Accreditation (ANECA) framework.

The context of quality and accreditation along the Bologna’s process

By signing the Bologna Declaration in 1999 European ministers committed to create a European Higher Education Area with the strategic objective of the definition of criteria and methodologies to evaluate the quality in a comparable way, which fosters and supports the development of mobility of students and staff between Higher Education institutions [7]. Fig. 1 show the principal events in the European convergence process.

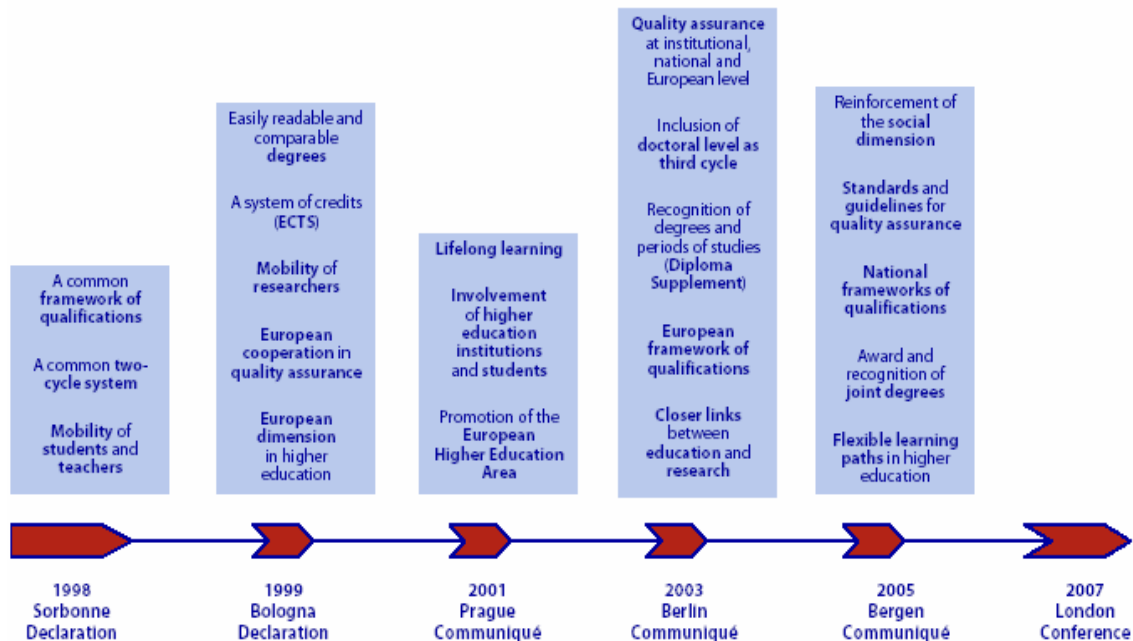


Fig. 1. Timeline of the Bologna Process [8]

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According to the Declaration of Prague (2001), it was particularly stressed that the quality should be an important determinant of Europe’s international attractiveness and competitiveness [9]. As discussed at the Graz Declaration of the European University Association (EUA) the policy goals for an appropriate European Quality Assurance dimension were:

- Achieve greater compatibility while managing diversity of Quality Assurance (QA) procedures. The diversity reflects specific national circumstances that each national QA framework tries to address.
- Preserve and extend institutional autonomy while meeting the demands for accountability.
- Avoid a big bureaucracy, burdensome QA mechanisms and promote cost-effective QA procedures. Funds can not be wasted on complex bureaucratic arrangements or on other tasks that will put an excessive drain of human and financial resources.
- Ensure the role of the Higher Education sector in any future monitoring scheme. It is essential that the sector plays a role in any future monitoring scheme in order to guarantee that academic core values are upheld and to ensure the adhesion of the academic community.
- Promote innovative and dynamic institutions in a context characterised by diversity of missions, goals and curricula. EUA’s proposes a set of six standards that include QA procedures to promote institutional autonomy by evaluating institutions against their mission and strategic plans, to promote organisational quality, to develop internal quality measures, to assure public accountability by including stakeholders in the process, to follow guidelines that are transparent and, by last, QA agencies with internal quality processes that can be evaluated themselves (See Figure 2) [10].

A COMMON FRAMEWORK					
Level				Equivalent	Shared
Descriptor	Subject	Basic	Quality	quality	accreditation
BA MA	standard	quality	Model	assessment system	criteria

Fig. 2. A common framework for QA

Later, in the Berlin Communiqué of 19th September 2003, Ministers underlined the need and importance of developing common methodological instruments and criteria to be applied on quality assessment and accreditation processes of Higher Education in Europe [6].

Therefore, they agreed that by 2005 national quality assurance systems should include:

- A definition of the responsibilities of the bodies and institutions involved.
- Evaluation of programs or institutions, including internal assessment, external review, participation of students and the publication of results.
- A system of accreditation, certification or comparable procedures.
- International participation, co-operation and networking. Currently, almost all countries have made provision for a quality assurance system based on the criteria set out in the Berlin Communiqué and with a high degree of cooperation and networking. However, there is still progress to be made, in particular as regards student involvement and international cooperation.

According to the Bergen Communiqué (2005), Ministers responsible for Higher Education:

- Have urged higher education institutions to continue their efforts to enhance the quality of their activities through the systematic introduction of internal mechanisms and their direct correlation to external quality assurance.
- Have adopted the standards and guidelines for quality assurance in the European Higher Education Area as proposed by ENQA.

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- Have committed themselves to introduce the proposed model for peer review of quality assurance agencies on a national basis, while respecting the commonly accepted guidelines and criteria.
- Have welcomed the principle of a European register of quality assurance agencies based on national review and have asked that the practicalities of implementation be further developed by ENQA in cooperation with EUA, European Association of Institutions in Higher Education (EURASHE) and National Unions of Students in Europe (ESIB) with a report back to us through the Follow-up Group.
- Have underlined the importance of cooperation between nationally recognised agencies with a view to enhancing the mutual recognition of accreditation or quality assurance decisions.
- Have charged the Follow-up Group with continuing and widening the stocktaking process and reporting in time for the next Ministerial Conference and by 2007 to have largely completed the implementation of the standards and guidelines for quality assurance as proposed in the European Association for Quality Assurance in Higher Education (ENQA) [11]-[12]-[13].

ENQA has played a crucial role in the implementation of institutional assessment as part of the activities of higher education institutions. This positive experience of networking will go to be imitated for the purpose of accreditation, so in the accreditation the institutions establish clear objectives, plan their activities and define their programmes. A growing number of heads of European accreditation agencies are increasingly becoming convinced that the solution pass through networking. In this way we are progressing towards a knowledge of the methodologies, parameters and procedures used by the different agencies. This will bring a gradual convergence of criteria, mechanisms and working tools until to reach a consensus. This was the objective of the European Consortium for Accreditation (ECA). ECA is an agreement for co-operation between 12 accrediting and evaluation bodies in 8 countries (founding session in Cordoba in November 2003): Der Österreichischen Akkreditierungsrat, Der Fachhochschulrat (Austria), Akkreditierungsrat ZeVa, FIBAA, ACQUIN, AQAS (Germany), HETAC (Ireland), NVAO (The Netherlands and Belgium) Nokut (Norway), ANECA (Spain) and OAQ (Switzerland). ECA has addressed issues relating to mutual recognition of accreditation decisions among its component agencies.

A major part of the ECA's activity is connected with the ENQA compiling a report on quality assurance for the European Ministers of Education at Bergen in May 2005 [12]. The main results and recommendations of this report are:

- There will be European standards for internal and external quality assurance, and for external quality assurance agencies.
- European quality assurance agencies will be expected to submit themselves to a cyclical review within five years.
- There will be an emphasis on subsidiary, with reviews being undertaken nationally where possible.
- A European register of quality assurance agencies will be produced.
- A European Register Committee will act as a gatekeeper for the inclusion of agencies in the register. A European Consultative Forum for Quality Assurance in Higher Education will be established.

The report is composed of three parts covering internal quality assurance of higher education institutions, external quality assurance of higher education, and quality assurance of external quality assurance agencies. Part 1 proposes standards and guidelines for:

1. Policy and procedures for quality assurance: Institutions should have a policy and associated procedures for the assurance of the quality and standards of their programmes and awards.
2. Approval, monitoring and periodic review of programmes and awards: Institutions should have formal mechanisms for the approval, periodic review and monitoring of their programmes and awards.
3. Assessment of students: Students should be assessed using published criteria, regulations and procedures which are applied consistently.
4. Quality assurance of teaching staff: Institutions should have ways of satisfying themselves that staff involved with the teaching of students is qualified and competent to do so.

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5. Learning resources and student support: Institutions should ensure that the resources available for the support of student learning are adequate and appropriate for each programme offered.
6. Information systems: Institutions should ensure that they collect, analyse and use relevant information for the effective management of their programmes of study and other activities.
7. Public information: Institutions should regularly publish up to date, impartial and objective information, both quantitative and qualitative, about the programmes and awards they are offering.

In 2002 the Dublin descriptors for Bachelors and Masters were first proposed and with the Joint Quality Initiative (JQI) meeting in Dublin on 23 March 2004 they were established [13].

Origins and development of quality evaluation structure in the Spanish university system

The first initiatives with regard to quality assurance in Spain emerged in 1992 with the Experimental Programme for Quality Evaluation of the university system, the objective of which was to validate a methodology for institutional assessment inspired by previous international experiences. Seventeen universities participated in the programme, which was followed by the Evaluation of Quality in Higher Education in 1994, a pilot project backed and funded by the European Commission. This project involved around fifty universities in Europe, including four Spanish ones. In 1995, through the enactment of Royal Order 1947/95, the National Evaluation Plan for Quality in the Universities (PNECU) was set in motion and developed between 1996 and 2000 [14].

The aims of the PNECU were to promote institutional assessment, provide a homogenous and compatible methodology within the context of the European Union and provide objective information that could serve as the basis for decision-making by the different organisations within their scope of action.

When the PNECU came to an end, the Second Universities Quality Plan (PCU) was implemented through enactment of Royal Order 408/2001, which was in force from 2001 until 2003, when it was integrated into the programmes of ANECA and the regional agencies. This Plan continued to develop institutional assessment, methodologies that were homogenous with existing ones in the European Union, and greater participation by the Autonomous Communities in developing and managing the Plan by helping to set up regional evaluation agencies.

The Coordinating Council of Spanish Universities, through its Secretariat General, was the authority responsible for managing the abovementioned quality plans. It had the assistance of a specifically set up Technical Coordinating Committee in this, and the collaboration of the regional agencies that carried out evaluation processes within their respective areas of jurisdiction.

From 2001 onwards, the Spanish Universities Act laid down that the National Agency for Quality Assessment and Accreditation of Spain (ANECA), in addition to the regional agencies, would be responsible for carrying out the work of evaluation, certification and accreditation of degree programmes, teaching, research and teaching staff management activities, and the services and management of the universities. The main purpose of ANECA is to monitor, by way of evaluation, certification and accreditation, the performance of the public service of university education according to objective procedures and transparent processes, and to reinforce transparency and comparability as a means for the promotion and quality assurance of both public and private universities and their integration into the European Higher Education Area. ANECA's scope of action is nationwide in Spain; its principles for action are the respect for university autonomy, cooperation with the regional Agencies and Administrations, and an attitude of mutual collaboration in all processes that lead to ensuring the quality and competitiveness of the Spanish university system. Its Strategic Plan defines the path for the Agency to realise its vision of being recognised as the national and international point of reference for quality assurance in the higher education system and of generating credibility and trust in terms of its usefulness, transparency, efficacy and agility [16].

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Structure of Spanish university degree programmes in the EHEA

In the Royal Order (RD) 55/2005 and Royal Order 56/2005, both of 21 January, together with Royal Order 1509/2005, of 16 December, which amends the previous ones, the new structure for university education according to two different levels, undergraduate and postgraduate were established [17]-[18]. They are structured into three cycles:

- *Undergraduate degree programmes.*

The first cycle of university studies comprises degree programmes that are basic and give a general education, together with others that serve as a preparation for professional activities. Students who pass this cycle are awarded the corresponding qualification, with the corresponding title given by the Government.

- *Postgraduate degree programmes.*

The second cycle of university studies involves a specialised or multidisciplinary advanced training, with either an academic or professional specialisation, or the start of research work. Students who pass this cycle are awarded a Master's degree.

- The purpose of the third cycle of university studies is advanced training in research techniques. This may include courses, seminars and other activities aimed at training in research and includes the preparation and presentation of the corresponding doctoral thesis, which consists of an original piece of research work. Students who pass this cycle are awarded a doctoral (Ph.D.) degree.

On 26 September 2006, the Ministry of Education and Science published the *document The organization of university education in Spain*, and the *Draft proposal: Guidelines for preparing university undergraduate and Master's degrees*, of 21 December 2006.

In the new structure levels are defined using the Dublin descriptors, no specific directions for contents, but strong directions about how to design a program making emphasis on objectives, competence and the way of reaching these objectives, including accreditation procedures, study programs will be checked ex-ante and accredited ex-post and study programs need to be defined in terms of expected competences and accreditation should be based on learning outcomes [13]-.

In relation with the structure of pre-EHEA university degree programmes, there are four types of university education currently in existence that are not adapted to the EHEA and which must adapt to the above-mentioned structure in a process that will be progressively implemented up until 2010. These are:

- First cycle (short cycle) degree programmes: these are orientated towards professional qualifications and students who pass this cycle are awarded either a Diploma or General Degree, and, in Engineering and Architecture, an equivalent qualification. In general, they have an official duration of three years.

- First and second cycle degree programmes (long cycle): according to the type of studies, students who pass both cycles (first and second) are awarded the equivalent of an Honours Degree, and, in Engineering and Architecture, an equivalent qualification. In general, they have an official duration of either four or five years.

- Second cycle only degree programmes: these studies, which generally have a duration of two years, lead to the award of the equivalent of an Honours Degree, and, in Engineering and Architecture, an equivalent qualification, entry to which requires certain first cycle qualifications or a long cycle first degree.

- Third cycle degree programmes: Honours degree graduates and those with the equivalent in Engineering and Architecture are eligible for these studies, the purpose of which is specialization in different areas, as well as training in research techniques. On completion, students obtain an accreditation diploma certificate of advanced studies that enables them to present doctoral these to obtain a doctorate degree.

At the present time in Spain, there are 73 universities, 50 on a public basis (48 of them depend on the Autonomous Communities and 2 of them on The Ministry of Education and Science⁴) and 23 on a private basis (7 of them belong to the Catholic Church). The power to regulate the conditions for obtaining, issuing and recognising academic and professional degrees is reserved for the State. The Ministry of Education and Science, as a department of the General Administration of the State, is responsible for exercising jurisdiction over quality.

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The guidelines for establishing new university degree programmes in Spain, defined in Royal Orders 55 and 56 of 2005, which lay down that curricula leading to the award of recognised undergraduate university degrees shall be drawn up and approved by the universities, in accordance with the corresponding general and specific guidelines established by the Government for each degree. These curricula are approved by the Ministry of Education and Science, and authorisation from the corresponding authority in the respective Autonomous Community is necessary for the degree programme to be introduced.

At this moment, the common criteria for accrediting de Grade and Master Diplomas are seven:

- Formative program. Objectives and structure.
- Teaching organization. The teaching activities are well planned and there are mechanisms for coordinate and communicate all activities so the learning process is developed correctly.
- Human resources. Good personnel with technical and educational knowledge, doing research, development and innovation oriented to the educational process.
- Material resources. Good facilities for developing learning activities like classrooms, laboratories, working places and library with books and technical papers easily accessible.
- Formative process. Orientation programs during the period of study and after it for the first placement in the labor market. Evaluation of the learning process is coherent with the objectives and as well there are mechanisms for promoting the mobility of students (national or internationally) for study or for practical work in companies.
- Results. Students, graduates and employers are satisfied with the results of the educational program (knowledge, abilities and know how).
- Quality Assurance. There are systematic studies for analyzing the input in the labor market, evaluate the satisfaction of students, staff and employer and improve continuously the activities in the teaching and learning process.

But for the Doctor diploma the common criteria have been reduced to six, only formative process is not included in the criteria, but the other six are oriented in a similar way as for the Grade and Master, but with evaluation of the research activity (published papers, contracts between enterprise and university, etc).

Other actors can be the Educational Professional Associations. For example, in the engineering area, the Spanish Chapter of the IEEE Education Society, created created 4 years ago, has a very important mission because of the new education system based on the Bologna declaration helping teachers in these changes [6]. Apart from a Dissemination Committee, the Spanish chapter of the IEEEEdSoc is organized through two more Committees, Technical and Activities. Its objectives support the different actors involved in the Bologna process, as for example identifying the existing procedures of accreditation in education within the areas of engineering for its correct implementation or sponsoring forums for educators to evaluate educational programs and approaches. As well, it is clear that our problem is similar to other European countries, so we need to share our solutions with other chapters of the IEEE Region.

Trends for the future: the AUDIT Program

In Spain, the Agency ANECA has adapted the ENQA guidelines to the Spanish context and has published a document 17 with a set of guidelines for the systems of internal quality guarantee within HEI. These guidelines could be envisaged with the perspective delineated in the Figure 3.

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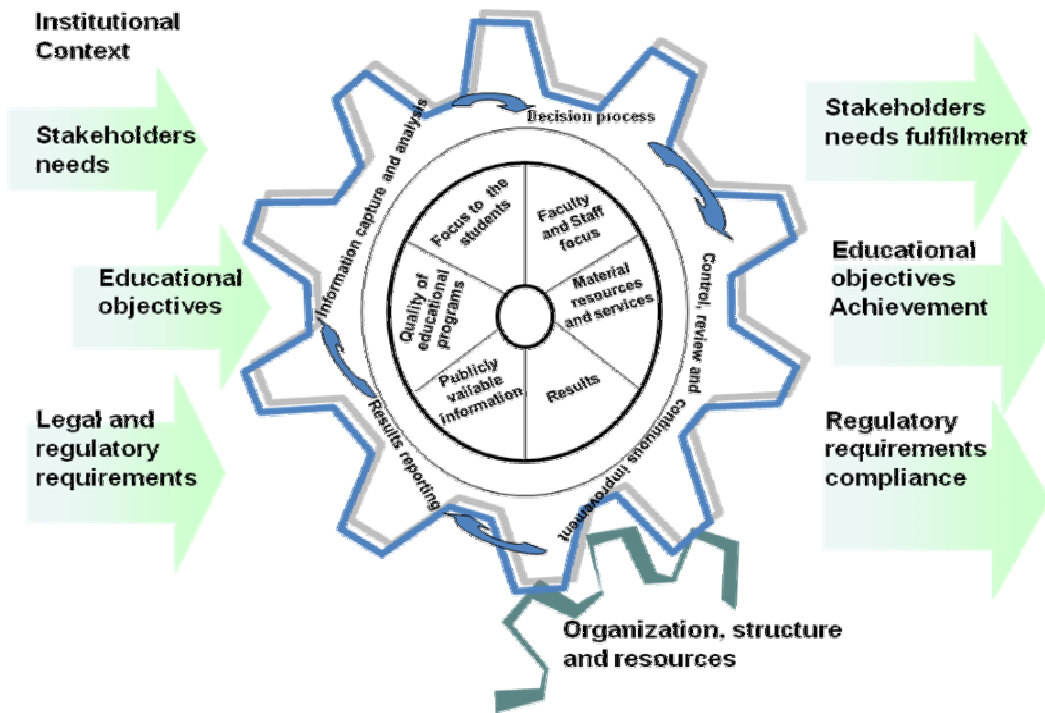


Fig. 3. ANECA Quality Model for Higher Education (AUDIT Program)

The guidelines defined by ANECA essentially cover the strategic objectives that intend to answer to the following fundamental questions:

- ¿How the University defines its quality policy and objectives?
- ¿How the University guarantees the quality of its educational programs?
- ¿How the University focus its teaching to the students?
- ¿How the University guarantees and improves the quality of its Faculty personnel?
- ¿How the University manages and improves its facilities, material resources and services?
- ¿How the University analyses and takes in account the results of its action plans?
- ¿How the University publishes the curricula information?

A summary of the ANECA guidelines are herein described:

1. The University must consolidate a culture of quality, supported by a known formal policy and objectives of quality, publicly available.
2. The University must implement mechanisms that allow it to maintain and to improve its educational offering, developing methodologies for periodical approval, control and review of the educational programs.
3. The University must build procedures that allow it to validate that the actions put in place have the fundamental aim of fostering the students learning.
4. The University must implement mechanisms that assure the access, management and training of Faculty and Staff should be done with the necessary guarantees to fulfill their duties.
5. The University must implement mechanisms that allow it to design, manage and improve its services, facilities and material resources with the aim of a proper development of the students learning.
6. The University must put in place procedures that allow it to guarantee that the results (in the areas of learning, placement success, and satisfaction of the different stakeholders) are measured, analyzed and used in the decision processes and in the improvement of the teaching quality.
7. The University must implements the mechanisms that allow it to guarantee the periodical publication of updated information related to curricula and programs.

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The stakeholders involved should be pointed out, along with the way used by the University to present its quality results to these stakeholders. The different elements, such as procedures and processes that form a system that allow rolling out the quality policy should be put in place along with the procedures to define, approve, review and improve the quality policy and objectives.

University autonomy requires that each institution decides on its standards and in the definition of the quality policies in the context of several sources. This is the first problem an school must manage.

The definition of the quality policy in the Computer Engineering School of the Universidad Politécnica de Madrid (UPM) has required the analysis of several strategic sources explained. In this case, strategic plans must distinguish those ones referred to the school and the university to which belongs. Although the UPM has currently an Institutional Quality Program (PIC), it has no strategic plan yet.

The UPM, (www.upm.es), approved in the year 2005 a quality program named “Programa Institucional de Calidad” (PIC, Institutional Quality Program) [19] with the following key objective: to measure the quality and to foster and to assist the initiatives of continuous improvement in the different Schools, departments and units of the institution.

The PIC general objective can be developed in a set of more detailed sub-objectives:

- To adapt the educational offer to the society and employers needs.
- To adapt the teaching methodologies to the Educational European Space (EES).
- To enhance the effectiveness and quality of the educational processes.
- To develop curricula and educational programmes with international dimension.
- To provide a continuous learning offering.
- To foster the interaction among the system R+D+I, the technology transfer and the teaching.
- To strength the application of the ICT in the educational processes.
- To promote the image of the University at national and international level, and to disseminate the contribution of the University to the society.
- To define criteria for resources distribution based upon results.
- To encourage a culture of continuous improvement.

By the other side, the Mission and Vision Statements of the School of Computer Science approved last October (www.fi.upm.es), is the basis too for the quality policy. As it says concerning to the accreditation: “... the academic offer shall be conformed to the European guidelines accreditation and others internationally recognized in the engineering sector...”.

By this reason to establish a comprehensive quality policy and strategy, the criteria for quality certification and accreditation of different organizations in the USA and Europe have been taken into consideration, particularly ABET, Accreditation Board for Engineering and Technology [20], and Baldrige [21] in the USA, and EFQM (European Foundation for Quality Management) [22] in Europe.

The preliminary conclusion is that, in general terms, the policy and strategy elements defined in the above mentioned criteria are quite similar to those covered by other sources: ENQA and ANECA guidelines, and the Institutional Quality Program, PIC, of the UPM. On the other hand, the certification criteria usually provide with more detailed quality requirements, since they focus on “how the organization does” kind of questions to evaluate the performance of the organizations. For this reason, the certification or award criteria are very useful as a guidance to identify the key processes in the organizations.

Conclusions

The focus on quality in the Bologna process has certainly raised awareness within higher education institutions of the potential benefits and challenges of effective quality assurance and enhancement activities. More constructive discussion between institutions, quality assurance agencies, stakeholders and public authorities appears to be taking place, and the involvement of students in quality assurance activities also seems to be gaining ground. Indeed in some parts of Europe, quality assurance seems to be replacing degree structure reform as the main topic of interest in the Bologna process.

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International agreements are at times seized as an opportunity to promote a national agenda. This applies here as well, and not only in Spain; it explains the significant differences in the way in which the signatories of Bologna are carrying out the agreements.

The introduction of accreditation meant that more emphasis was put on accountability. On the one hand this meets the need to guarantee the level of the countries' programmes abroad, but it also serves the purpose of introducing a more robust system of quality assurance. But if the accreditation movement is allowed to spread without systematic thought or design, Europe will be faced with a jungle of procedures, matching the jungle of its degrees. If this situation is allowed to develop, it will reduce more transparency and student protection and will increase obstacles to academic and professional mobility. On the other hand, re-thinking current teaching structures, methods, evaluation and flexibility is a task still ahead.

REFERENCES

- [1] European Council of Barcelona, 2002. http://www.bologna-berlin2003.de/pdf/Pres_Concl_Barcelona.pdf
- [2] London Communiqué. Towards the European Higher Education Area: responding to challenges in a globalised world. 18 de mayo 2007. http://www.eua.be/fileadmin/user_upload/files/Publications/Londoncommuniquedoc.pdf
- [3] Council of the European Union, in its *Resolution on modernising universities for Europe's competitiveness in a global knowledge economy* (2007)
- [4] J. Davies. Cultural Change in Universities in the Context of Strategic and Quality Initiatives. 2000. http://www.eua.be/eua/jsp/en/upload/Strategic_Manag_Uni_institutional_Development.1069322397877.pdf
- [5] M. Edwards & L. M. Sánchez-Ruiz. In search of the academic and organizational change in Spanish universities. In R. Roy (Ed.). *Education Engineering Education*. National Institute Of Technical Teachers Training & Research, Kolkata (India) (Forthcoming).
- [6] Berlin Communiqué. Realising the European Higher Education Area. 19 September 2003. http://www.bologna-berlin2005.no/Docs/00-Main_doc/030919Berlin_Communique.PDF
- [7] F. Jurado1, M. Llamas, E. Tovar, F. Arcega, F. Mur, J.A. Sanchez and M. Castro. A review of the accreditation bodies and processes in Europe. A vision from the Engineering. 35th ASEE/IEEE Frontiers in Education Conference. October 19 – 22, 2005, Indianapolis.
- [8] Eurydice. Focus on the structure of higher education in Europe. National trends in the Bologna Process - 2006/07 Edition.
- [9] Declaration of Prague Towards The European Higher Education Area. May 19th. 2001. http://www.bologna-berlin2005.no/Docs/00-Main_doc/010519PRAGUE_COMMUNIQUE.PDF
- [10] Graz Declaration of the European University Association (EUA). Forward from Berlin: the role of the Universities. 2003. http://www.eua.be/fileadmin/user_upload/files/EUA1_documents/COM_PUB_Graz_publication_final.1069326105539.pdf
- [11] Bergen Communiqué. The European Higher Education Area - Achieving the Goals. 2005.
- [12] European Association for Quality Assurance in Higher Education (ENQA). Standards and Guidelines for Quality Assurance in the European Higher Education Area. 2005.
- [13] JQI. Shared 'Dublin' descriptors for Short Cycle, First Cycle, Second Cycle and Third Cycle Awards. 2004. http://www.eua.be/fileadmin/user_upload/files/EUA1_documents/dublin_descriptors.pdf
- [14] J. Ginés Mora and J. Vidal. Two decades of changes in Spanish Higher Education: learning the hard way. In A. Amaral, A. Gornitzka and M. Kogan (Eds.), *Reform and change in higher education: renewed expectations and improved performance*. Springer, 2005, pp. 136-152.
- [15] L. Wilson. Common instruments for assessment and accreditation in Europe. *Methodological Instruments for assessment and accreditation in the European Framework*, ANECA, July 2004.
- [16] ANECA self-evaluation report according to the standards and guidelines for quality assurance in the European higher education area. 2007. http://www.aneca.es/quees/docs/enqa_autoevaluacion_eng_070328.pdf
- [17] R. D. 55/2005, Official University Degree regulation. BOE num. 21, 25-jan-2005.
- [18] R.D. 56/2005, Official University Master and Doctorate regulation. BOE num. 21, 25-jan-2005.
- [19] PIC: Programa Institucional de Calidad. UPM. 2005. www.upm.es/innovación.
- [20] Criteria for Accrediting Engineering Programs during the 2008-2009 evaluation cycle. ABET Board of Directors. 2007. www.abet.org.
- [21] Education Criteria for Performance Excellence. Baldrige National Quality Program. www.baldrige.com/baldrigecriteria.htm, 2007.
- [22] EFQM Excellence Model. EFQM. 2007. www.efqm.org.
- [23] E. Tovar Caro and M. Castro. Building Common Spaces in Engineering Education: A Review From ICECE05. *IEEE Transactions on Education*. Volume 50, Issue 1, 2007, pp. 79 – 84.

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