CRITICAL FACTORS IN THE IMPLANTATION OF NEW EUROPEAN STUDIES PROGRAM: THE SPANISH CASE

Edmundo Tovar Caro[1]

Abstract *— Good designs of new studies in Engineering Higher Education is not enough to guarantee the success of the new studies programs. These memories include challenges and changes never faced before by the universities' staff that must be overcome. This paper identifies, in opinion of the author, the key factors that must be dealt with the implantacion of these programs: understanding the accreditation oriented process, learning guides, treatment of the generic competences, new organization and the application of a methodology for changes management.*

Index Terms — European Higher Education, competencies, assessment, degrees

QUALITY AND ACCREDITATION PROCESS

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 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. 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.

The establishment of networks of assessing entities was sponsored by the European Commission in exercise of its competences in respect of promoting the European dimension and incorporating added value to Member States' initiatives. The supreme such entity is the ENQA which was recognized by the conference of ministers at Berlin in September 2003 as the preferred interlocutor in matters of quality assurance in the European Convergence process. The Ministers of the Bologna Process signatory states invited ENQA through its members, to develop an agreed set of standards, procedures and guidelines on quality assurance and to explore ways of ensuring an adequate peer review system for quality assurance and/or accreditation agencies or bodies. The standards and guidelines were designed to be applicable to all HEI and quality assurance agencies in Europe, irrespective of their structure, function and size, and the national system in which they are located. Institutions and agencies themselves, cooperating within their individual contexts, are in charge of to decide the procedural consequences of adopting the standards contained in this report (Table I)

TABLE I
EUROPEAN STANDARDS AND GUIDELINES FOR INTERNAL QUALITY ASSURANCE WITHIN HIGHER EDUCATION INSTITUTIONS

Nº	Description
1.1	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
1.2	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
1.3	Assessment of students: Students should be assessed using published criteria, regulations and procedures which are consistently applied
1.4	Quality assurance of teaching staff: Institutions should have ways of satisfying themselves that staff involved with the teaching of students are qualified and competent to do so
1.5	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
1.6	Information systems: Institutions should ensure that they collect, analyze and use relevant information for the effective management of their programmes of study and other activities
1.7	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

1 Edmundo Tovar Caro, Universidad Politécnica de Madrid, Departamento de Lenguajes y Sistemas Informáticos e Ingeniería Software, Campus de Montegancedo, Boadilla del Monte 28660, Madrid, Spain, Edmundo.tovar@upm.es

But in several european 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.

The Thematic Network in Engineering Education has worked developing a tool fully compatible with ENQA requirements and, in general the European trends toward internal Quality Assurance of Programmes [13]. The tool developed is named: "Tool for Quality Assurance And Assessment of Engineering Education". The Q.A. FRAMEWORK is designed to be maintained on an ongoing basis rather than as a periodic reporting structure. For this reason it is recommended that the ongoing maintenance could be controlled and delivered by internal Faculty;

Taking into account basic Quality Assurance requirements and European guidelines, the Framework has been wrapped around Learning Outcomes and/or Academic Competences, which are now the most interesting development under way at the international level. During design of the Q.A. FRAMEWORK, this line of thought has been deployed into the following set of hierarchical core requisites.

- The Programme must be clearly designed around external Requisites and related Competencies which are in agreement with the needs of the employers and the labour market; such relations should be present already at the design phase, and not only (as it often happens) at the moment of the Stage or of the final project:
- The Programme must be clearly deployed with up-to-date Learning Outcomes, which are in agreement (content, amount, level) with the target competencies.
- The Programme must expose the students to an appropriate learning environment, with appropriate and up-to-date equipment.
- The Programme appropriately certifies that Learning Outcomes have been reached, the exams have a certifying value.

The Q.A. FRAMEWORK captures the critical information which is required by stakeholders such as employers, the labour market, students, educational policy makers, educational establishments. It collects all the details which are strictly necessary.

In the absence of any current prescribed model, this Framework can be adopted as a Programme design tool as a checklist for its evaluation and as a guideline for the implementation of internal Quality Assurance.

Meeting all three of these needs calls for an approach based on permanent monitoring: the degree program must be asked to produce and maintain the Q.A. FRAMEWORK that contains all the qualitative and quantitative parameters needed to arrive at an informed judgment about the degree program's aims, methods and the learning environment provided to the student.

While this Q.A. FRAMEWORK is necessarily a public document, it can be flanked by a periodic "Selfevaluation Report" prepared exclusively for parties inside and outside the institution who are involved in any form of evaluation and accreditation. This "Report" would describe quality factors and the actions involved in control, highlighting the degree program's strengths and weaknesses, corrective measures, review activities and follow-up, and their effects over time.

The Q.A. FRAMEWORK is thus the foundation for all future evaluation/accreditation processes. It must satisfy minimum requirements for content and form so that degree programs of the same or similar type offered by different institutions can be readily compared. (figure 1)

Figure 1. The Quality Assurance Framework Matrix [13]

A similar framework is used in Spain to design for new degrees are evaluated according to a series of quality based criteria and guidelines. The criteria and guidelines set out in this document assess the quality of programmes of study according to:

- The importance of justification for the degree.
- The suitability of the general aims and competences.
- Whether adequate mechanisms regulating student entry and admissions are clearly established.
- The coherency of the programme of study.
- The adequacy of academic and support staff, together with the physical resources and services.
- Envisaged efficiency in relation to the anticipated results.
- The internal quality assurance system for revising and enhancing the programme of study.
- The adequacy of the schedule for anticipated introduction.

The proposed quality-based criteria and guidelines have been defined in accordance with the provisions and appendices of Royal Decree 1393/2007, the standards and guidelines for the evaluation of university education established at the Meeting of Ministers in Bergen (May 2005) and the INQAAHE Code of Good Practices for

Quality Assurance Agencies. In relation to the standards and guidelines, a clear distinction is made between those that correspond exclusively to the Bachelor level, those that correspond exclusively to the Master's level, and those that refer to both levels.
The most important thing as for the objective of this paper is that these criteria are used later to accredit the implantation of the programs. Here drivers in the process of implantations of programs are identified:

COMPETENCES AS FOCUS OF LEARNING

In the majority of the European countries and within the movement to the European Higher Education Area (EHEA) competences and learning outcomes have acquiring renewed relevance for the curricular reform. They are considered a key aspect for answering to the fast technological change in the production and management knowledge and to the gap between the education and the labor market requirements [3]-[10]. Although competences and competency are concepts very used in the educative area in United States and some European countries (United Kingdom, Denmark, Finland, France), in the Spanish case they are in the early stages of developing and planning [11] .

In Spain employers affirm that some competences in certain non-technical areas such as communication ability, economics, leadership, teamwork and management are not practically being considered in their formation. Accreditation Boards, Engineering Associations, and governments in Spain are demanding the incorporation of the called generic or transferable competences for the actual and the future engineering degrees.

In this context, one of the main goals is that students reach both generic competences (transferable skills) and subject-related ones, although it is broadly accepted that key outcomes of university programmes will be subject related competences. Generic competences constitute the basis for the ability to develop discipline-specific competencies, their interactions in an occupation-specific context are essential to be able to handle non-routine and unusual, complex working situation [10].

This approach supposed important changes in the current teaching-learning processes of many Institutions such as the Computer Engineering School of the Universidad Politécnica de Madrid. Principles of this new learning focus include active learning, ensuring links between new and previously learned knowledge, effective feedback, and scaffolding to help learners organize learning experiences.

Once the quality of an academic's teaching was the primary consideration, quality often measured in the quantity of content imparted. Now the shift in focus is to what the students are learning. The role of the teacher, when focused on student learning, is crucial but not in the traditional sense. The teaching activities that we now need to focus on are the creation of an engaging learning environment, providing the learning stimulus, supporting the learner, and providing effective feedback on the learner's progress.

The three important terms are significant, long-term, and changes. Significant can be considered as the learner having an appreciation and understanding of the content, not simply a rote-learned knowledge. This would entail the student having a working knowledge or the ability to apply and relate what is learned. The concept of long-term knowledge relates to the knowledge existing beyond the examination period: the knowledge is a working knowledge that provides the basis for further learning and application. Finally, changes mean not only the taking on board of the information but the integration of that knowledge with other knowledge. Integration of knowledge learned is critical to it effective use.

In the document of the Spanish Education Ministry in 2003 [12] it is said that the official degrees will have to provide a university formation in which the generic competences are integrated harmonically with basic ones; transversal competences related to the integral formation of the people and specific competences than make possible a professional profile that allows the graduates integration in the work market.

A core competences mapping process

We define competency mapping as the process of identifying key competences for a particular degree. In our institution, it was begun supporting and enabling staff to fully reflect upon potential competences, conducting formal research to identify the most important competences, and reaching consensus. Although the principal advantage of core competences is that they facilitate communication within disciplines among the state's faculty. Also it constitutes an instrument for the academic cultural change. At present, faculty and staff are developing and articulating these important linkages to create strong curricula plans.

Later, we must work to answer appropriately the following questions:

- Where in the curriculum can students learn and practice skills such as writing, critical thinking, speaking, and teamwork?
- What teaching strategies and assignments are useful to help the students develop these skills?
- What assessments would be selected to determine if students are mastering the generic competences?
- How competences are to be worked, realized and assessed and the impact of this change, both at individual and European university structure level, needs further research and debate.

Competences and learning outcomes play a key role in the teaching and learning process within the European

Higher Education Area framework. Generic competences and their corresponding learning outcomes should not only be defined on the level of formal qualifications such as degrees but also on the level of modules or courses. Their inclusion in the pieces and the total of a curriculum stimulate its consistency and comparability.

In Spain still there is a gap between "theory" and "practice" between competences, learning outcomes and curricular development. It is important that faculty staff can explore and validate reliable ways to design and evaluate competence based curriculum.

THE MANAGEMENT OF THE CHANGE

A good design of the study program does not guarantee the succes in its implementation.

When a change happens there is always resistance.

If people do not understand the organization and do not assimilate the change, it will not happen globally. The consequences of not implementing the change, not only affect the sense of not getting the expected results, but may cause other unwanted effects.

The successful implementation of change, of any kind whatsoever, lies in the adoption of this change by the people To do so, requires certain actions aimed at: Encourage, involve, educate and train, publicize the benefits, manage expectations and provide support.

The implementation of these changes in the way of planning the course, monitor this planning, making decisions based on new data collected, or the performance of new roles that had not appeared previously carried out through processes. Each one of these processes must be applied under a methodology of change management.

THE ORGANIZATION

The needs of information to guarantee the success of the study program require the constitution of several Committess with the broad participation of teachers. Efforts in coordination are the most important. This way we try to avoid:

- Possible cases of overlap of contents of disciplines, or gaps in subsequent subjects from the reports prepared by the relevant academic title Commission requirements.
- Conflicts arising from teaching in the school or faculty from the reports prepared by the relevant academic title Commission.
- The absence of criteria for academic credit recognition by solidarity and cooperation, participation in cultural, sporting, academic activities of student representation, prior consultation of representatives of student associations and delegation of students.
- A sibjective recognition and transfer of credits for students from other degrees, and the best possible academic itineraries to students in their destination degrees.

Of special interest is the horizontal coordination, to track

- the development of the semester reporting the main conclusions drawn from this monitoring the degree and give the necessary to correct possible deviations in the half, of the planned development recommendations.
- The possible overlaps between subjects in terms of content, and other potential problems arising from the same planning (dates of delivery or examinations, gaps in content in subjects, distribution of the workload students reasonably uniform of the semester and course, scripts etc.).
- The workload assigned to the student with respect to the real worload, in terms of ECTS and in training activities.

Finally, the Vertical Coordination focus on the tracking the development of each of the courses that make up a particular subject, ensuring that there is communication and the necessary coordination among these, avoiding gaps or duplication of content.

CONCLUSIONS

It is not enough to count on a good design of a study program. It is need special attention to special factors new to the staff, as the elaboration of the learing guide, to manage generic competences, and all of them applying a methodology of changes management.

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