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TEACHERS' FEATURES IN THE DEGREE OF BUILDING ENGINEERING AT THE UNIVERSITY OF ALICANTE

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Abstract

All new university degrees (implemented a few years ago) are undergoing a process to renew the accreditation of qualifications (ACREDITA program) by quality assessment and accreditation agencies. This process aims to "check whether the results of the degree are suitable and guarantee the continuity of their teaching until the next reaccreditation"; to do so, the assessment is structured in two main phases. First, a self-evaluation is performed where each university describes and assesses the situation of the degree considering several guidelines and criteria. Second, there is an external evaluation in which an accrediting agency makes a valuation of the situation to verify the degree of compliance with the conditions mentioned above.

There are three internationally recognized quality principles which are valued in the ACREDITA program: title management, resources and results; at the same time, these dimensions are subdivided into seven criteria. One of these criteria is to assess the academic profile of teachers who teach in every university degree, a key feature throughout the entire teaching process.

The present research aims to contextualize the evolution and current situation of the academic staff who teaches and has taught in the Degree of Building Engineering at the University of Alicante, to establish proposals for the improvement during the monitoring of the title. To this end, we have analysed the results of the main indicators used by quality agencies, as well as other characteristics proposed by the authors to draw conclusions about the reality of university teachers.

Keywords: Accreditation, university degree, building engineer, university teachers.

1 INTRODUCTION

Official university studies in Spain are regulated by Royal Decree 1393/2007 [1] and Royal Decree 861/2010 [2], along with other legislative changes which state that official university degrees must undergo a process of external evaluation by the National Agency for Quality Assessment and Accreditation (hereinafter ANECA). Prior to the establishment of a university degree, its design needs to be evaluated by a process called VERIFICA. In a second phase, and once the degree has been implemented, ANECA tracks the development of such implementation through the MONITOR program. And finally, once the implementation of the degree is completed, it should be subjected to a cyclic process to renew the accreditation and to maintain its status as an official degree, by the program called ACREDITA [3]. Verification, monitoring and renewal processes of accreditation are focused on ensuring the quality of official university courses and facilitating continuous improvement from certain standards [4].

For this reason, a large number of studies of masters and university degrees which were implemented from 2010 are being subjected to a process for their accreditation renewal by agencies for quality assessment and accreditation. This process aims to "check whether the results of the degree are suitable and allow guaranteeing the continuity of their teaching until the next renewal of accreditation" [5]. To do so, an assessment structured in two main phases is performed:

- First, through a self-evaluation where each university describes and assesses the situation of each degree on several pre-set criteria and guidelines;
- And secondly, by an external evaluation in which an accrediting agency makes an assessment of the situation to verify the degree of compliance considering the above criteria and guidelines.

On the one hand, every official university studies (Degrees, Masters and Doctorates) will renew their accreditation in accordance with the procedure established by each Autonomous Community in relation to the universities' jurisdiction. On the other hand, official university degree courses with 240

credits (ECTS) must renew their accreditation within a maximum period of six years from the date of the degree verification or from the date of their last accreditation (Article 24.2 of RD 1393/2007).

In the ACREDITA program, three principles of internationally recognized quality are valued: title management, resources and results. At the same time, these dimensions are subdivided into seven criteria as described below [5].

- DIMENSION 1. MANAGEMENT OF THE DEGREE
 - Criterion 1: Organization and development. The training program is updated and has been implemented in accordance with the conditions set out in the verified memory and / or its subsequent amendments.
 - Criterion 2: Information and transparency. The institution has mechanisms to adequately communicate the program features and processes that ensure their quality to all stakeholders.
 - Criterion 3: Internal Quality Assurance System (IACS). The institution has a formally established and already implemented internal quality system that effectively ensures quality and continuous improvement of the degree.
- DIMENSION 2. RESOURCES
 - Criterion 4: Academic Staff. Academic staff who teach is sufficient and appropriate according to the characteristics of the degree and the number of students.
 - Criterion 5: Support staff, material resources and services. Support staff, material resources and services available to the development of the degree are appropriate depending on the nature, type, number of enrolled students and skills acquired by them.
- DIMENSION 3. RESULTS
 - Criterion 6: Learning results. Learning outcomes achieved by graduates are consistent with the profile of graduates and correspond to the level MECES (Spanish Qualifications Framework for Higher Education) of the degree.
 - Criterion 7: Indicators of satisfaction and performance. The results of the indicators about the training program are consistent with the design, management and available resources, and they meet the social demands of their environment.

Because of the great importance of the accreditation process of university studies, this research is focused on the Degree of Building Engineering at the University of Alicante. This degree started the accreditation process in late 2015, which has allowed knowing the current situation of the studies from the point of view of an External Evaluation Commission.

1.1 Objectives

The criterion 4 of ACREDITA program aims to evaluate the academic profile of teachers who teach in the university degree, as a foundation of the entire teaching process. This research seeks to contextualize the evolution and current situation of the academic staff who has taught / teaches in the Degree of Building Engineering at the University of Alicante, to establish proposals for monitoring improvement in the degree. For this purpose, the results of the main indicators used by quality agencies are analysed, as well as other proposed by the authors for drawing conclusions about the reality of university teachers.

1.2 The Degree of Building Engineering at the University of Alicante

The former studies of Building Engineering (3 years) were converted to current Degree of Building Engineering (4 years) and adapted to the European Higher Education Area (EHEA), through a new system of accumulation and transfer of credits in order to create a standard system of transferable credits at a European level. This new degree offers a more focused approach to student training, by measuring the effort it spends promoting their self-learning and encouraging a more active participation.

The Degree of Building Engineering gives access to the regulated profession with the same name, so it should allow the acquisition of those skills necessary for the professional practice. This must be done by acquiring knowledge, abilities and skills covered in the curriculum.

By Resolution of 17 December 2007 [6] and the Order ECI / 3855/2007 of 27 December [7], the specific regulations for the university studies called Degree of Building Engineering were published, establishing the duration of the curriculum in 240 European credits (60 credits per academic year).

During the 2010-11 academic year, the University of Alicante initiated the first degree course of Building Engineering. In the 2013-14 year, the first students who began their studies of Building Engineering graduated. Year 2015-16 is the sixth year that the studies are taught, with extensive experience and good information on surveys and academic results.

While the Degree of Building Engineering was implanted in 2010-11, an adaptation course for professionals and graduates was offered; at the same time, we proceeded to the gradual extinction of the previous curriculum.

1.3 Results of the accreditation process

In December 2015, the Valencian Agency of Evaluation and Prospective (AVAP), designated by the accreditation agency ANECA, issued a favourable final report regarding the accreditation renewal of the Degree of Building Engineering of the University of Alicante. That report described that the worst criterion valued, and where we should take action to significant improvement, is related to academic staff (criterion 4). The report does not question the ability and qualifications of teachers, but makes a criticism of its stability and the number of doctors who taught in the degree.

The indicators used by accrediting agencies to assess these two aspects are:

- Rate of full-time academic staff. For an academic year (X), percentage ratio between the full-time faculty in the degree (T) at the University (U) and the total number of teachers in the degree (T) at the University (U).
- Rate of teachers holding a PhD. For the academic year (X), percentage ratio between the number of teachers holding PhD qualifications who teach in the degree (T) at the University (U) and the total number of teachers who teach in the same degree (T).

The main findings of the report related to teacher accreditation are as follows [8]:

- *"The teaching load must be distributed on a priority basis to full-time teachers in a university degree."*
- *"... The Degree of Building Engineering is currently a university degree with professional responsibilities, requiring higher proportions of teachers and full-time teachers holding PhD qualifications than those currently available."*
- *"... In the monitoring reports it is recommended to increase the proportion of full-time teachers and teachers holding PhD qualifications."*

These problems come mainly from two issues: the low rate of teachers' replacement in recent years and the difficulty of access to doctoral studies in some technical degrees.

In different laws on State Budget, the replacement rate of public universities has been limited: particularly between 1997 and 2002 the replacement rate was 25%, between 2003 and 2008 it was 100%, in 2009 it was 30%, in 2010 it was 15%, and from 2011 to 2014 it was 10% [9]. This has resulted in a high reduction of teachers hired by the government, with obvious consequences on the teaching and research quality of universities.

On the other hand, most of the teaching faculty who taught in former studies of Building Engineering were graduates of that profession but also there were other graduates in architecture and engineering. As former Building Engineering studies had duration of 3 years (equivalent to a diploma), it was not possible to access directly to doctoral programs. With the emergence of masters programs and university doctorate regulated by Royal Decree 56/2005 [10], the access of Building Engineers to these postgraduate studies was provided.

2 METHODOLOGY

The research design is not experimental; it is descriptive and longitudinal, by using a database where relevant information has been collected from the sample under study. Data has been collected on teachers who have taught in the Degree of Building Engineering at the University of Alicante from the academic year 2010-11 to 2015-16, with data disaggregated by teachers, course and subject. With

these data, we have compiled tables per academic year where the number of teachers and professional status is quantified, also considering the type of employment contract, the hours devoted to teaching, the department name and the provision of PhD qualifications. Course 2015-16 data are provisional, since by the writing of this communication the academic year was not over.

An analysis of the evolution of teachers over six academic courses is done by studying the variations of teachers hired (full-time and part-time), as well as teachers with PhD qualifications. To this end, several categories have been grouped according to similarities, for example by grouping all categories of university teachers (see Table 1).

In the first part of the work, the evolution of the number of teachers and the percentage of teaching hours by category and the academic year is studied. In the second part, the rate of full-time faculty and teachers holding a PhD per academic year in the Degree of Building Engineering is described, providing data of the same rates for all degrees at the University and the Polytechnic School of Alicante.

Table 1. Groups of categories of university teachers

Abbreviation	Denomination	Type Of Contract
CU-CEU	University Professors (Catedrático de Universidad y Catedrático de Escuela Universitaria)	Full time
TU-TEU	Senior Lecturers (Titulares de Universidad y Titulares de Escuela Universitaria)	Full time
CON-DOC	Teachers holding a PhD (Profesorado doctor: colaborador, contratado doctor y ayudante doctor)	Full time
AYU	Teaching Assistants (Profesores Ayudantes)	Full time
ASO	Associate Professors (Profesores Asociados)	Part time

3 RESULTS

Fig. 1 shows the evolution of the number of teachers who have taught for the Degree of Building Engineering, highlighting the number of tenured faculty categories and associated against other labour figures. These data do not show the number of teachers contracted in each academic year, but the number of them who have taught in the degree. Up to 2012-13, there was a significant increase in the number of teachers, mainly because an adaptation course was implemented for professionals and former graduates, and also because of the simultaneity of the old curriculum and the new degree. From the academic year 2013-14, a reduction in the number of teachers is observed due to the gradual extinction of the old curriculum, as well as the reduction in the number of new students. On the other hand, the low representation of categories such as professors, PhD holding teachers (in whatever form) and teaching assistants is evident.

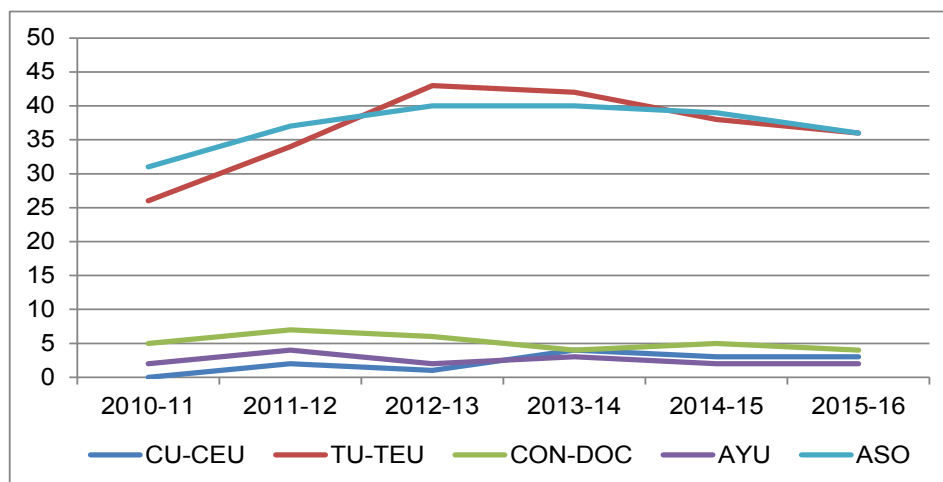


Fig. 1. Number of teachers hired by categories and academic year

Another aspect valued in the accreditation of the degree is that teaching should mainly be sustained by full-time teachers. Fig. 2 shows the percentage of hours (or credits) taught by teachers considering each represented category. As it can be seen, in most courses 60% of credits have remained taught by full-time faculty, while in the course 2015-16 (provisional data) the full-time faculty represents 70%. If we represent the percentage of the number of teachers, values fall 53% between 2010 and 2014, and 60% for the academic year 2015-16. These results show that most of the teaching load lies in the full-time faculty, and has positively evolved over time.

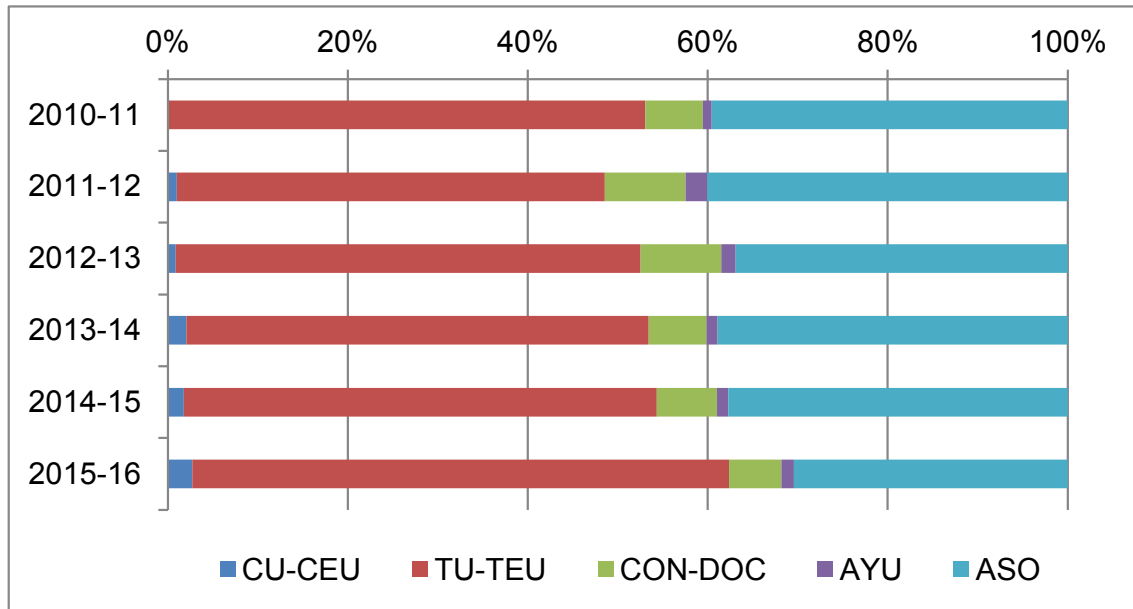


Fig. 2. Percentage of teaching hours per categories and academic course

To analyse the evolution of the rates about full-time faculty and PhD holding teachers we have chosen to compare four values for each academic year. On the one hand, we have obtained the value of the rate based on people for all degrees at the University of Alicante (UA degrees) and the rate based on people for all degrees taught at the Polytechnic School (EPSA). On the other hand, we have quantified rates based on individuals and on teaching hours (or credits) for the Degree of Building Engineering (GAT). Thus, these graphs allow to compare the situation of the degree with other degrees offered at the Polytechnic School and the University and to compare between two different ways of calculating rates based on people or teaching hours.

After a detailed analysis of Fig. 3, it can be concluded that rates of full-time faculty of the Degree of Building Engineering are below those obtained in the EPSA and at University. This demonstrates a disadvantage compared to other degrees that have stabilized a greater proportion of their teachers. As for the oscillations produced in the rates of all degrees at University, we consider that they can be caused by an increase in the recruitment of associate professors during 2011-12 and 2012-13 courses.

On the other hand, variations between full-time teachers in the degree have remained stable. We must highlight the differences between the rate obtained from the number of teachers and from the number of hours or credits, being higher in the latter. This is due to the high proportion of Senior Lecturers (TU-TEU) and the reduction in teaching hours for Associate Professors (ASO), without actually reducing this group in number.

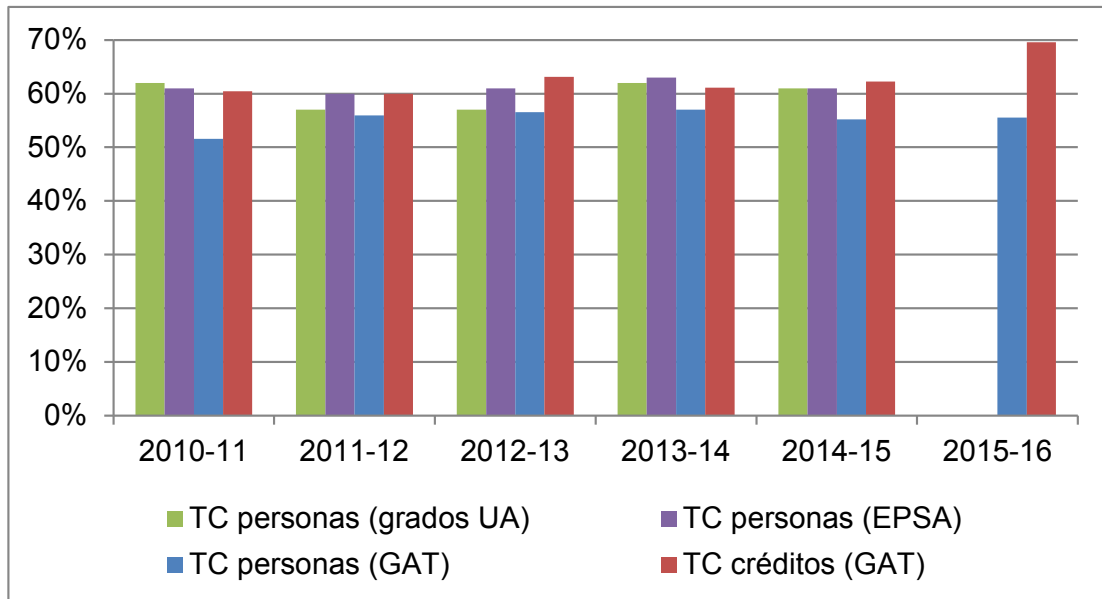


Fig. 3. Percentage of full-time faculty teachers by academic year

The analysis of rates about PhD holding teachers (Fig. 4) ensures that there is a very differentiated distribution between the Degree of Building Engineering and other degrees in EPSA and the University. The rates obtained in all degrees at University evolve similarly to those of EPSA, highlighting an increase next to the 60% of the teachers in 2013-14. On the contrary, in the Degree of Building Engineering we obtain rates between 35 and 40% for PhD holding teachers using the criterion of persons, and 30-35% using the criterion of teaching hours or credits. In the last academic year 2015-16 (provisional data), there has been a significant increase in the rate of PhD holding teachers as a result of recent dissertations of doctoral thesis by hired teachers. Future projections are good, but this rate is likely to remain stable over time.

We think that the number of people used to calculate rates of full-time faculty and PhD holding teachers should be reviewed by the accreditation agencies. There may be situations of considering a lot of full-time teachers but with little academic load imparted on the degree, which can distort the true reality of the indicator. If we used the number of teaching hours or credits for calculating, it will be more difficult to alter rates, as they will be weighted by the effective charge of each teacher. This proposal is very simple to apply and avoids possible "manipulation" of rates.

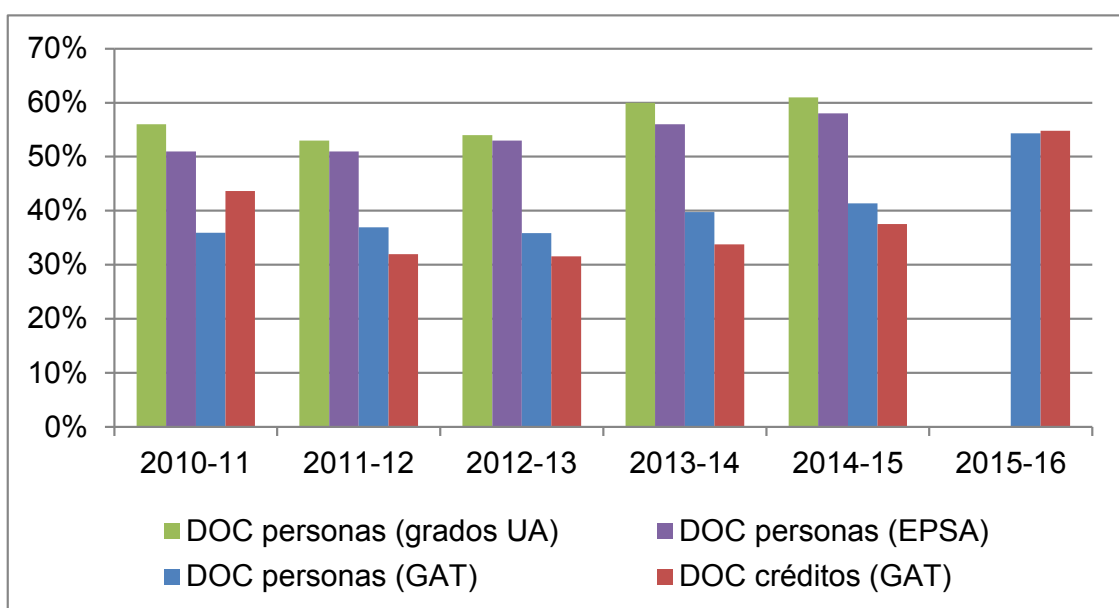


Fig. 4. Percentage of PhD teachers per academic year.

4 CONCLUSIONS

On the one hand, it is evident that the incorporation of full-time faculty has slowed as a result of the limitations in replacement rates fixed by Universities. This situation has led universities to cover their educational needs with part-time teachers and, in most cases, without PhD qualifications.

As evidenced from the above graphs, the Degree of Building Engineering has been affected by the use of indicators based on people versus those based on teaching hours. It seems more consistent to quantify rates of full-time and PhD holding teachers based on the number of credits.

Of the data provided, it can be noted that there is a high representation of part-time associate professors and this should meet the needs of the degree. On the other hand, it is evident an increasing number of PhD holders to be maintained or increased in subsequent years.

Finally, a critical judgment on how to calculate teachers' indicators (full-time faculty and PhD holders), where the number of people is used instead of the hours of teaching, is made. This may be due to the technical difficulty of quantifying hours in detail versus the ease of counting the number of teachers. This research suggests that it is more realistic to use the number of hours, as it allows compensating those teachers with low academic load in the degree, against those who have more teaching representation.

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