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Proposal

Title: Quality of academic staff in Portuguese higher education institutions: a risk management approach

Abstract: The purpose of this article is to analyse the composition of teaching staff in Portuguese higher education institutions and assess the existing gap between reality and desirability, in the context of the accreditation regime. A risk-based approach to quality assurance was followed by analysing indicators of staff numbers, staff qualifications, staff tenure, and staff-student ratios and comparing them with mandatory minimum standards. The differences between public and private, university and polytechnic institutions and differences across subjects are discussed. The work reveals significant differences regarding staff quality indicators within Portuguese higher education institutions. This work had implications for setting policy in respect of the accreditation of degrees in Portugal and for the establishment of rules regarding a transitional period for institutions to be able to comply with mandatory minimum standards. Although this work focuses on the Portuguese case, it might inform other cases where accreditation of degrees is being implemented.

Introduction

The Portuguese higher education system is binary, with universities and polytechnics, both public and private (Amaral and Magalhães, 2007). Recent legislation has changed the legal framework for higher education by introducing concepts linked to new public management and policies that follow trends observed in northern European countries. The new legal framework has addressed changes in governance and management of higher education institutions, academic careers and quality assessment and accreditation.

The new legislation has created a new agency for assessment and accreditation of higher education institutions and their programmes (A3ES), while defining new minimum standards for the qualification of academic staff and implementing a more clear separation between universities and polytechnics to preserve the binary system. In this paper we examine how A3ES defined a set of performance indicators to implement the minimum quality standards. They are in accordance with standard 1.4 Quality assurance of teaching staff of the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ENQA, 2009). At the same time the developed procedure is in line with an emergent risk-based approach to accreditation (Raban, 2013).

The qualification of teaching staff in Portuguese higher education institutions

The Quality Assessment Act, Law 38/94 of 21 November, established the first Portuguese Quality Assessment system for higher education, following closely the Dutch model. In 2005 the Portuguese government asked the European Association for Quality Assurance in Higher Education (ENQA) to review the national accreditation and quality assurance practices and to provide recommendations for the establishment of a new system complying with the European Standards and Guidelines (ESG) (Amaral and Rosa, 2008). Following the recommendations of the ENQA review team (ENQA, 2006) a new Quality Act was passed (Law 38/2007 of 16 August) establishing a new legal framework for assessment and accreditation, while a new Decree-Law (369/2007 of 5 November) created the Agency for Assessment and Accreditation of Higher Education (A3ES).

The legal framework was complemented with Law 62/2007 of 10 September defining the new legal framework for higher education institutions, Decree-Law 207/2009 of 31 August defining the new academic career for polytechnic institutes, and Decree-Law 205/2009 of 31 August defining the new academic career for universities.

The new legislation sets standards for accreditation that are related to standards for staff qualification, such as minimum thresholds for professors in the top two echelons, ceilings for professors on temporary contracts and a minimum percentage of staff holding a doctorate in universities or holding a title of specialist in polytechnics.

This new legislation also establishes a set of rules aiming at clarifying the binary system by creating a more visible separation between universities and polytechnics and avoiding the trend for academic drift of polytechnics. One of the instruments to ensure this separation was the idea that the academic staff at universities should be based on academic staff with a

doctorate, while for polytechnics it should be based on specialists, meaning people active in their professions and able to promote the more vocational emphasis of polytechnic education.

At the same time, the Bologna degree structure has increased postgraduate numbers, at the level of the master. The new legislation is based on an understanding that a university needs doctors and research activity to be able to provide good quality postgraduate education while polytechnics should rely more on professional expertise and provision of expert services to society. The legislation also allows for the provision of integrated masters in areas such as medicine, architecture, engineering and psychology, but only universities can offer this type of degrees.

Methodology

The new legislation on quality assessment and accreditation directs A3ES to decide on the prior accreditation of proposals for new study programmes while deciding on the accreditation of programmes already being offered by all Portuguese higher education institutions. Programme accreditation is based on minimum standards set by law.

The Agency realised that there were more than 5,200 study programmes on offer (1st, 2nd and 3rd cycle programmes) and their accreditation represented a huge task (A3ES, 2010). To deal with the problem the Agency decided to implement a system based on an electronic platform thus completely eliminating the use of paper. Institutions were asked to inform A3ES of which programmes they would like to offer in the future, and to provide information about them; including information about available human resources and their qualification. These procedures allowed the Agency to build an updated database on the Portuguese higher education system. This database provides the basic information for deciding which programmes do not comply with the new legal requirements – computer programmes read the database and calculate performance indicators for institutions and programmes (Sarrico, 2010) – and therefore need a more urgent assessment and accreditation process. This represents a somewhat risk management approach to accreditation, at least insofar as it represents "a system of triage in which under-performing institutions will be selected for closer scrutiny" (Raban, 2013).

In the preliminary use of the database, with data from 2010, indicators were calculated for each unit of each institution. Each institution was coded as public, private and Catholic University (UCP). Each unit, when possible, was also coded by subject. Only the units that represent a homogeneous subject were coded (for instance, 'Faculty of Law'), units that were deemed too heterogeneous were not considered (for instance, whole institutions with varied provision, which are not divided in faculties).

Quality indicators for academic staff

The university sub-sector

The first analysis regards the numbers of academic staff with a doctorate in terms of headcount and FTE, and type of contract: permanent or temporary (Table 1).

Table 1: Staff numbers in the university sub-sector (2010)

Type	Total FTE academics	Academics on a permanent contract with a doctorate		Academics on a temporary contract with a doctorate		Academics with a doctorate	
		Head count	FTE	Head count	FTE	Head count	FTE
UCP	786	338	300	388	80	726	380
Private	2993	1826	1222	515	133	2341	1355
Public	12090	9630	8897	1359	561	10989	9457
Total	15869	11794	10418	2262	774	14056	11192

From **Table 1**, it can be seen that there is a significant discrepancy between the number of FTE academics and FTE academics with a doctorate: almost 30% of FTE academics did not held a doctorate. This means that the university sub-sector is still a long way away from the ideal of all academics being in possession of a doctorate. Those with a doctorate are mostly on permanent contracts; only 7% of FTE academics with a doctorate are on temporary contracts.

Academics with a doctorate tend to be professors, which divide in three categories: full, associate and assistant. Full and associate professors have tenure to the university where they work. Assistant professors are eligible for tenure after 5 years of service, subject to successful evaluation by peer review. The other categories of staff can be found in **Table 2**.

Table 2: Composition of academic staff by category in the university sub-sector (2010)

Type	Full professors		Associate professors		Assistant professors		Assistants		Trainee assistants		Language teachers	
	Head count	FTE	Head count	FTE	Head count	FTE	Head count	FTE	Head count	FTE	Head count	FTE
UCP	31	21	93	114	224	200	253	208	107	50	16	13
Private	259	158	515	372	1176	738	1517	878	433	191	0	0
Public	1220	1143	2146	2000	6274	5772	1155	971	33	32	180	150
Total	1510	1321	2754	2486	7674	6709	2925	2056	573	273	196	163

The law, since 2009, envisages that the doctorate should be the prerequisite for access to the profession in the university sub-sector, and establishes an ideal interval for the percentage of full and associate professors to be between 50% and 70%. **Table 3** shows how far away from those ideals the sector is.

From the analysis of **Table 3**, it can be seen that both the Catholic University and the private sector lag significantly behind in terms of qualified academic staff with a doctorate. However, in terms of the percentage of full and associate professors, relative to all professors, the entire university subsector lags significantly behind what is envisaged by the law. It seems that the mainstay of universities continues to be the assistant professors.

Table 3: Qualifications and tenure of academic staff in the university sub-sector (2010)

Type	FTE academics with a doctorate/ Total FTE academics	Full and Associate Professors on a permanent contract/ Professors on a permanent contract
UCP	48%	36%
Private	45%	40%
Public	78%	35%

The law establishes a ceiling of 1/3 for professors on temporary contracts. This is clearly broken by UCP, which seems to have a policy of mostly hiring professors on temporary contracts. The private sector, in general, violates the standard only for assistant professors, and the public sector, on average, keeps well within the limit (**Table 4**).

Table 4: Professors on temporary contracts in the university sub-sector (2010)

Type	Full professors on temporary contracts	FTE full professors on temporary contracts	Associate professors on temporary contracts	FTE associate professors on temporary contracts	Assistant professors on temporary contracts	FTE assistant professors on temporary contracts
UCP	66%	34%	44%	10%	52%	25%
Private	26%	12%	24%	16%	41%	26%
Public	14%	4%	15%	5%	18%	9%

The numbers on students for the university sub-sector can be found in **Table 5**. Postgraduate students already represent 44% of students in the universities. Recently, this percentage increased significantly with the Bologna reforms of the degree structure, which shortened the 1st cycle to three years (which used to be typically 4 or 5 years). The question now is if all universities have the capacity, in terms of staff with doctorates and research activity, to sustain this level of postgraduate provision.

Table 5: Student numbers in the university sub-sector (2010)

Type	Total including 1st cycle students	2nd cycle students	Integrated master's degree students	3rd cycle students
UCP	10643	2947	685	656
Private	52158	6468	10696	605
Public	188805	37532	48858	12358
Total	251606	46947	60239	13619

In terms of staff student numbers, these look reasonable when FTE academics are used in the denominator. However, the situation changes when FTE academics with a doctorate are used instead (**Table 6**). In the latter case, the private sector, on average, does not abide by the requisite of having at least one doctor per 30 students.

Table 6: Number of students per FTE academic in the university sub-sector (2010)

Type	All degrees students		2nd cycle students		Integrated master's degree students		3rd cycle students	
	Per FTE academic	Per FTE academic with a doctorate	Per FTE academic	Per FTE academic with a doctorate	Per FTE academic	Per FTE academic with a doctorate	Per FTE academic	Per FTE academic with a doctorate
UCP	13,5	28,0	3,8	7,8	0,9	1,8	1,7	0,8
Private	17,4	38,5	2,2	4,8	3,6	7,9	0,4	0,2
Public	15,6	20,0	3,1	4,0	4,0	5,2	1,3	1,0

The indicators discussed above hide a wide variability between fields of study. A detailed picture of the situation is thus accounted for in Table 7. As seen previously, the whole sector presents a significant deficit of academics with a doctorate, but the situation seems to be even more pressing in the cases of Architecture, Arts, Business Studies, Health and Law. This has then implications for the number of students per academic with a doctorate, whose minimum standard of 30 students per doctor is consistently violated. The situation seems to be particularly acute in Law and widespread to the three types of institutions (UCP, private and public). In terms of the precariousness of staff, the most extreme situation seems to be the UCP case. The Arts, Health and Law also distinguish themselves in this issue, possibly given their eminently professional characteristics, where people tend to practice their profession outside of the university.

Table 7: Staff quality indicators for the university sub-sector by subject area (2010)

Subject	FTE academics with a doctorate/ FTE academics	Academics on a permanent contract with a doctorate/ Academics with a doctorate	Full and Associate Professors on a permanent contract/ Professors on a permanent contract	Full professors on temporary contracts	Associate professors on temporary contracts	Assistant professors on temporary contracts	Number of students per FTE academic	Number of students per FTE academic with a doctorate	2nd cycle and integrated master's degree students per FTE academic with a doctorate	3rd cycle students per FTE academic with a doctorate
Agriculture	91%	99%	38%	4%	1%	4%	11,6	12,7	6,6	0,6
Public	91%	99%	38%	4%	1%	4%	11,6	12,7	6,6	0,6
Architecture	47%	83%	24%	0%	4%	32%	12,6	29,1	26,0	2,1
Public	47%	83%	24%	0%	4%	32%	12,6	29,1	26,0	2,1
Arts	29%	68%	23%	52%	33%	34%	11,2	42,0	16,9	0,5
Private	20%	44%	17%	67%	70%	38%	11,9	60,4	28,4	0,0
Public	36%	87%	28%	42%	5%	31%	10,7	28,2	8,3	0,9
Business	51%	73%	34%	37%	29%	30%	16,4	32,6	5,1	0,5
UCP	53%	65%	26%	33%	33%	38%	15,6	29,9	7,6	0,2
Private	36%	70%	35%	56%	25%	30%	13,1	35,0	2,7	0,2
Public	72%	78%	35%	22%	33%	29%	21,3	29,9	7,8	1,0
Education	79%	73%	34%	26%	23%	29%	22,6	28,7	13,8	2,6
UCP	45%	26%	33%	75%	67%	76%	19,1	42,6	27,9	3,8
Private	66%	77%	41%	30%	10%	30%	20,3	29,3	11,4	1,0
Public	89%	80%	32%	15%	20%	20%	23,9	26,2	12,2	3,0
Health	53%	61%	48%	31%	37%	56%	14,4	27,1	20,6	2,9
UCP	54%	33%	38%	79%	51%	67%	27,8	46,4	34,3	10,5
Private	50%	70%	50%	41%	19%	50%	9,7	19,9	14,9	0,0
Public	53%	67%	51%	13%	38%	54%	11,8	23,4	18,2	1,6
Humanities	72%	62%	50%	17%	20%	34%	15,4	21,1	6,9	2,1
UCP	62%	44%	66%	24%	27%	54%	12,3	19,7	11,0	3,2
Public	83%	80%	33%	11%	12%	15%	18,5	22,4	2,9	1,0
Law	44%	72%	49%	30%	24%	33%	26,8	77,8	14,7	1,2
UCP	42%	72%	50%	86%	23%	28%	19,9	46,2	9,5	0,1
Private	30%	44%	44%	40%	67%	78%	35,1	116,4	7,9	0,4
Public	47%	78%	49%	5%	16%	27%	27,9	82,6	18,2	1,8
Sciences	84%	82%	29%	20%	18%	19%	13,7	17,2	6,3	2,1
UCP	67%	27%	12%	87%	80%	72%	15,8	23,9	1,7	13,3
Private	72%	81%	58%	0%	0%	39%	16,7	22,8	5,8	0,6
Public	86%	87%	29%	14%	13%	13%	13,3	16,2	6,7	1,2
Social Sci.	73%	83%	31%	18%	16%	21%	19,7	29,7	11,3	1,5
UCP	69%	44%	40%	55%	60%	58%	36,8	53,5	16,3	2,1
Private	54%	96%	28%	6%	10%	13%	17,9	37,7	18,0	1,0
Public	78%	86%	30%	14%	9%	17%	17,2	23,2	8,6	1,6

The polytechnic sub-sector

Table 8 shows how far away the polytechnic sub-sector is from the ideal of having all their staff either with a doctorate or specialist title. Of those that hold a doctorate 31% are on temporary contracts (FTE). When it comes to specialists the figure raises to 52% on temporary contracts (FTE).

Table 8: Staff numbers in the polytechnic sub-sector (2010)

Type	Total Academics		Doctors on permanent contracts		Doctorates on temporary contracts		Specialists on permanent contracts		Specialists on temporary contracts		Doctors + specialists
	Head count	FTE	Head count	FTE	Head count	FTE	Head count	FTE	Head count	FTE	FTE
Priv.	4317	2116	618	436	279	104	545	485	810	400	1424
Publ.	10013	8639	1306	1253	868	673	1189	1178	1983	1389	4493
Total	14330	10755	1924	1689	1147	778	1734	1663	2793	1788	5917

Those that hold either a doctorate or specialist title tended to be in the professoriate: either coordinator or assistant professor level. The other members of staff are in the assistant category (which then subdivides into three ranks) (Table 9). The law expects that more than 70% of staff members should be in the professoriate. Although in FTE terms this is already the case, with a value of 76%, as headcount the value drops to 55% (Table 10). More troublesome seems to be the precariousness of academics in the polytechnic sub-sector, especially in the public institutions, with 67% of staff on temporary contracts.

Table 9: Composition of academic staff by category in the polytechnic sub-sector (2010)

Type	Coordinator Professors	FTE coordinator Professors	Assistant Professors	FTE assistant Professors	Assistants	FTE Assistants
Private	450	473,5	1090	743,4	1597	469,6
Public	775	758,3	2280	2220,8	252	797,2
Total	1225	1231,8	3370	2964,2	1849	1266,8

Table 10: Qualifications and tenure of academic staff in the polytechnic sub-sector (2010)

Type	FTE academics with a doctorate + specialist academics/ Total academics	Coordinator and assistant professors/ Total academics	Academics on temporary contracts/ Total academics
Private	67%	51%	27%
Public	52%	55%	67%

Table 11 presents a more detailed picture of precariousness in the sub-sector, with an extreme value of 79% of FTE assistants on temporary contracts.

Type	Coordinator professors on temporary contracts	FTE coordinator professors on temporary contracts	Assistant professors on temporary contracts	FTE assistant professors on temporary contracts	Assistants on temporary contracts	FTE assistants on temporary contracts
Private	32%	18%	29%	18%	24%	26%
Public	11%	5%	50%	45%	94%	79%

Unlike what is typical of binary systems of higher education, the number of students in the polytechnic sub-sector is substantially lower than in the university sub-sector (**Table 12**). There is indication that this sub-sector is mostly second choice for applicants to higher education (Teixeira et al., 2009). Postgraduate students only represent 10% of total students.

Table 12: Student numbers in the polytechnic sub-sector (2010)

Type	Total including 1st cycle students	2nd cycle students
Private	26252	2444
Public	111460	10910
Grand Total	137712	13354

The student staff ratios seem adequate (**Table 13**), even when the higher restriction of FTE academics with a doctorate or specialist title is used as the denominator.

Table 13: Number of students per FTE academic in the polytechnic sub-sector (2010)

Type	1st and 2nd cycle students		2nd cycle students	
	Per FTE academic	Per FTE academic with a doctorate or specialist	Per FTE academic	Per FTE academic with a doctorate or specialist
Private	12,4	18,4	1,2	1,7
Public	12,9	24,8	1,3	2,4
Grand Total	12,8	23,3	1,2	2,3

A breakdown picture by major subject of study is given in **Table 14**. Additionally to well-defined areas, data on one called 'Technology & Business' is added, because there are a significant amount of schools with the two subjects functioning together. From the data, one can see that student staff ratios are not favourable for a number of subjects both in the private and public sector. Only Agriculture, Arts and Technology seem to present a satisfactory situation.

Table 14: Staff quality indicators for the polytechnic sub-sector by subject area (2010)

Subject	FTE academics with a doctorate + specialists/ FTE academics	Coordinator and assistant professors/ Academics	FTE academics on temporary contracts/ FTE academics	Students/ FTE academics	Students/ FTE academics with a doctorate + specialists	2nd cycle students/ FTE academics with a doctorate + specialists
Agriculture	51%	63%	42%	12,97	26,25	2,46
Public	51%	63%	42%	12,97	26,25	2,46
Arts	56%	66%	53%	6,66	12,99	1,71
Private	36%	75%	20%	4,85	13,72	2,87
Public	66%	62%	70%	7,57	12,63	1,14
Business	53%	55%	50%	24,24	39,80	3,03
Private	59%	56%	10%	39,27	36,52	2,66
Public	51%	54%	67%	17,80	40,97	3,16
Education	55%	57%	38%	11,46	24,44	4,79
Private	66%	66%	22%	9,69	15,80	5,71
Public	45%	48%	52%	13,10	32,46	3,95
Health	59%	56%	31%	12,37	27,47	1,16
Private	63%	47%	25%	14,00	33,68	0,20
Public	57%	60%	35%	11,52	24,23	1,66
Social Sci.	44%	75%	34%	11,37	28,17	3,44
Private	54%	65%	0%	9,94	18,30	0,00
Public	34%	84%	69%	12,80	38,05	6,88
Technology	60%	63%	53%	13,83	23,23	1,92
Private	78%	63%	20%	16,40	20,60	0,00
Public	56%	63%	62%	13,13	23,95	2,45
Technology & Business	42%	43%	76%	17,35	51,55	1,42
Public	42%	43%	76%	17,35	51,55	1,42

The importance of staff composition for the accreditation procedure

From this global picture, a detailed analysis of each degree was undertaken by A3ES. The new legislation has set more demanding rules for the qualification of the academic staff and it is obvious that in some areas such as Law, Architecture or the Fine Arts there are not enough resources at national level to comply with the new rules. Therefore, when the average for a subject area is clearly behind the standard required, a lower threshold linked to the national average was set and a period of time is given to institutions for complying with the new more demanding standards.

Conclusion

The use of an electronic platform has been an indispensable tool to deal with a massified higher education system. Performance indicators are calculated by using computer programmes that read the national database. These indicators are used to determine which institutions and programmes are far from complying with the new minimum quality standards.

The analysis of the database has revealed there is a gap between reality and what is intended by legislation, at least in some scientific areas. In these special cases it was decided to have a realistic transitional period, rather than to create an incentive to produce doctorates too quickly, which would raise legitimate questions about their quality. Indeed, developing relevant research activity in a new area is a slow process, and where there is no research activity one cannot expect to produce good quality doctorates.

It has also been made evident that running the system on traditional processes without the use of computer science would not allow for an efficient decision making system as the present one. Exploring more extensively the database, as it is continually updated with new accreditation cycles, will allow for a more accurate vision of the higher education system and to propose remedial action where it is necessary.

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Questions for discussion:

- What exactly is meant by quality of teaching staff in the context of the ESG?
- What actions are necessary to promote less developed areas and what time interval should be allowed for institutions to adapt to the new criteria?
- How important are performance indicators in risk-based quality management