

PORTUGUESE HIGHER EDUCATION SYSTEM AND BOLOGNA PROCESS IMPLEMENTATION

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Abstract

This research aims to analyze the growth of the Portuguese higher education system, as well as the courses diversification, after the implementation of the Bologna Process in 2006. On the one hand, the Constitution of the Portuguese Republic of April 2, 1976, gives to all citizens a right to equal opportunities for school success and to access to the higher education. On the other hand, the Bologna Process aims to construct a European higher education area that establishes comparability, compatibility and coherence between the higher education system through the harmonization of academic degrees and the guarantee of quality in all the European institutions. Thus, methodologically, this research relied on a two-track approach. The first approach takes the form of a literature review, based in the legal regime of Portuguese and European higher education system. The second approach takes the form of an empirical research based on a descriptive statistical analysis, supported on the statistical information provided by Portuguese Ministry of Education and Science that shows the increases of the Portuguese' qualifications and the courses diversification, after the implementation of the Bologna Process in 2006. Indeed, the research provides empirical evidence about the Portuguese higher education institutions engagement in the Bologna process.

Keywords: Higher Education system, Bologna Process, Portugal.

1 INTRODUCTION

The social, economic and technological development demand a constant adaptation of the conceptual field. In the higher education system, further the technical and scientific dimension, the institutions should center their main role in the competences of the knowledge with perspective of the basis of the sustainable development. In an intensive knowledge society that demands qualifications and competences the higher education as a strategic function grew considerably. In this context, the Bologna Process aim to construct a European higher education area that establish comparability, compatibility and coherence between the higher education systems through the harmonization of academic degrees and the guarantee of quality in all the European institutions.

This research aims to analyse the growth of the Portuguese higher education system, as well as the courses diversification, after the implementation of the Bologna Process in 2006. On the one hand, the Constitution of the Portuguese Republic of April 2, 1976, gives to all citizens a right to equal opportunities for school success and to access to the higher education. On the other hand, the Bologna Process aims to construct a European higher education area that establishes comparability, compatibility and coherence between the higher education system through the harmonization of academic degrees and the guarantee of quality in all the European institutions.

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The structure of the research is organized as follows. Section 2 focuses on Portuguese higher education system that split into polytechnics and universities, both public and private. Section 3 gives an overview of the bologna process implementation in Portugal. Finally, in the section 4 the authors summarize the principal conclusions.

2 THE HIGHER EDUCATION: THE PORTUGUESE SYSTEM

The Portuguese educational system is regulated by the Basic Law of the Educational System, approved by Law n° 46/86, of October 14 [1], being developed in three levels: primary, secondary and higher education. Particularly, the Portuguese higher education consists of a binary system which includes university and polytechnic education, both public and private. The university and polytechnic subsystems are mainly differentiated by their formative role in research: the polytechnics are more focused on practical and vocational courses; and the universities are generally focused on theory and research [2]. Thus, on the one hand, in Portugal the universities are guided by a perspective of promoting research and knowledge creation and aims to ensure a sound scientific and cultural preparation and provide technical training that develop the capacities of design, innovation and critical analysis [3]. On the other hand, polytechnics are guided by a perspective of applied research and development aimed at understanding and solving concrete problems and aims to provide a solid cultural and technical training of higher level to develop applications for the pursuit of professional activities [3]. Also, the polytechnics institutions have as main objectives the regional development and a close interaction with its operational environment that provided a flexible reaction to changes in its environment [4]. Thus, the polytechnics institutions present some potentialities, as: the innovative and dynamic capacity relatively to the traditional structures; the flexibility; and the adaptation capacity to the social-economic context; the near connection with the productive and social entities of the area where it is located; the strategy of diversification of the professed study programmes; and the rehearsal of pedagogic methods that motivate the creativity, the initiative, the risk and the collaboration inter-specialties [5] [6] [7] [8].

Table 1 presents the annual number of students enrolled on Portuguese higher education by subsystem and type of education from the academic year of 2006/07 (first year of the Bologna process implementation) to 2015/16 (last year available). In Portugal, the higher education system is based on three cycles of studies: first cycle - bachelor (*Licenciatura*), second cycle - master (*Mestrado*), and third cycle - doctor (*Doutoramento*). The duration of these levels change according with the degree and field of study. On average, the bachelor degree has 3 years (or 180 credits), but in fields of study such as engineering, law and architecture could be 5 years and in medicine till 6 years; the master degree has 2 years and doctor degree has 3 years [9]. Between the academic year of 2006/07 and the academic year of 2015/16, the number of students enrolled on Portuguese higher education decreased 2.8 per cent (corresponding to 10,330 individuals at an annual average decrease of about 1,033 individuals), in direct consequence of the significant fall of annual number of students enrolled on private subsystem, which decreased more than 36.0 per cent in the period. However, the public subsystem grown 8.2 per cent in the period, justified by the largest increase of the university subsystem (13.1 per cent, corresponding to 22,184 individuals), while the polytechnic subsystem has registered only an increase of 0.4 per cent in the last decade. But, the polytechnic subsystem to the academic year of 2014/15 has registered a decrease of 4.9 per cent (corresponding to 5,220 individuals).

Table 1. Higher education enrolled, by subsystem and type of education (2006/07 to 2015/16)

Subsystem	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Public	275,321	284,333	282,438	293,828	307 978	311,574	303,710	301,654	292,359	297,884
University	169,449	175,998	175,465	183,806	193,106	197,912	197,036	198,380	191,707	191,633
Polytechnic	105,872	108,335	106,973	110,022	114,872	113,662	106,674	103,274	100,652	106,251
Private	91,408	92,584	90,564	89,799	88,290	78,699	67,290	60,546	57,299	58,515
University	60,094	60,732	60,230	60,174	60,452	55,147	48,716	44,495	42,666	42,981
Polytechnic	31,314	31,852	30,334	29,625	27,838	23,552	18,574	16,051	14,633	15,534
Total	366,729	376,917	373,002	383,627	396,268	390,273	371,000	362,200	349,658	356,399

Source: Adaptation of [10]

Table 2 presents the evolution of graduates by subsystem and type of education from the academic year of 2006/07 to 2014/15 (last year available), proving the increase of the higher education graduates in Portugal. Indeed, between the academic year of 2006/07 and the academic year of 2014/15 (no data are available on 2015/16), the number of higher education graduates increased 7.4 per cent (corresponding to 6,200 individuals at an annual average decrease of about

689 individuals), following the trend in the European Union member states of a consistent growth in the number of higher education graduates [11]. This tendency results of the significant fall of annual private subsystem graduates, which decreased more than 29.7 per cent in the period. However, the graduates of the public subsystem grown 20.1 per cent in the period, justified by the largest increase of the university subsystem graduates (52.0 per cent, corresponding to 17,929 individuals), while the polytechnic subsystem has registered a decrease of 19.7 per cent in the last nine years.

Table 2. Graduates, by subsystem and type of education (2006/07 to 2014/15)

Subsystem	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
Public	62,063	64,469	57,428	58,091	65,308	73,206	76,373	72,940	74,565
University	34,497	37,366	37,391	38,323	44,059	49,666	53,888	51,048	52,426
Polytechnic	27,566	27,103	20,037	19,768	21,249	23,540	22,485	21,892	22,139
Private	21,213	19,540	19,139	20,518	21,821	21,058	18,494	15,563	14,911
University	11,640	10,340	11,457	12,333	13,336	13,427	12,337	10,767	10,484
Polytechnic	9,573	9,200	7,682	8,185	8,485	7,631	6,157	4,796	4,427
Total	83,276	84,009	76,567	78,609	87,129	94,264	94,867	88,503	89,476

Source: Adaptation of [10]

Table 3 shows the annual number enrolled on Portuguese higher education graduates by gender from the academic year of 2006/07 to 2015/16. Among both men and women, the number of students enrolled in the higher education system for those years 2006/07 to 2015/16 was decrease 2.8 per cent, reflecting this overall decrease mainly the reduction of women in higher education, which decreased 3.9 per cent (corresponding to 7,626 individuals) since the number of men enrolled showed a slight decrease of 1.6 per cent (corresponding to 2,704 individuals). This decline of women in higher education justifies the decrease in the relative importance of women in the total number of students enrolled annually in the higher education institutions. However, women are still responsible for the majority of students in the Portuguese higher education system [12].

Table 3. Higher education enrolled, by gender (2006/07 to 2015/16)

Gender	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Men	168,821	175,177	174,000	179,151	184,627	181,515	173,745	168,252	162,323	166,117
Women	197,908	201,740	199,002	204,476	211,641	208,758	197,255	193,948	187,335	190,282
Total	366,729	376,917	373,002	383,627	396,268	390,273	371,000	362,200	349,658	356,399

Source: Adaptation of [8]

Table 4 shows the graduates by gender from the academic year of 2006/07 to 2014/15, concluding that the increase of graduates is verified in both men and women. Nevertheless, the share of women in the total of graduates is greater than the weight of women in the annual number of students enrolled (see Table 3), so school success occurs mainly in the female gender.

Table 4. Graduates, by gender (2006/07 to 2014/15)

Gender	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
Men	32,130	33,900	31,185	31,354	34,541	37,231	38,151	35,977	36,171
Women	51,146	50,109	45,382	47,255	52,588	57,033	56,716	52,526	53,305
Total	83,276	84,009	76,567	78,609	87,129	94,264	94,867	88,503	89,476

Source: Adaptation of [8]

Face to this, the Constitution of the Portuguese Republic of April 2, 1976, related to the equality of access opportunities to the higher education and to the school success, and according to article 74 [13], must “*guarantee to all citizens, according to its capacities, the access to higher education degrees, to scientific research and to artistic creation*”. In this sense, Portugal has a binary system

integrating universities and polytechnics, but some strain has developed between universities and polytechnics due to academic and professional drift [14] [15]. “On the one hand, polytechnics resent what they consider to be lower social and autonomic status relative to universities. On the other hand, universities have tried to meet the demands of employers, consequently seen as occupying some of the polytechnics’ professional areas” [15].

3 THE HIGHER EDUCATION: THE BOLOGNA PROCESS

In order to develop its own higher education base, the European Union (EU) launched in 2006 the Bologna process [16]. The Bologna process is working towards developing a coherent European higher education space to foster employability and mobility in Europe, as well to increase the competitiveness of European higher education in the world [17]. Effectively, the dynamic ‘knowledge-based economy’ requires modernisation and coordination of the European higher education institutions, which monitored the development of research [6], increasing the match between supply and demand of skills, competences and labour [18]. Building the European area of higher education is an initiative of European states to converge their higher education structures, based on its intellectual, cultural, social, scientific and technological dimension and with respect to different cultures, languages, national education systems and Institutions autonomy.

The Bologna process obliges the European countries, including Portugal, to developing a number of instrumental objectives, such as [19]: promotion of the European dimension in higher education; establishment of a system of credits such as in the European Credit Transfer System (ECTS), as a proper mean for promoting student mobility; promotion of mobility by overcoming obstacles to the exercise of free movements of students, teachers, researchers and administrative staff; promotion of European cooperation in quality assurance with a view to developing comparable criteria and methodologies; adoption of a system of easily readable and comparable degrees; and adoption of a system essentially based on two main cycles, undergraduate and graduate.

Table 5 reflects the annual number enrolled on Portuguese higher education by level of education from the academic year of 2006/07 (first year of the Bologna process implementation) to 2015/16 (last year available). In the period, the third cycle (corresponding to doctoral courses) presents the most significant growth (corresponding to 16,092 individuals at an annual average growth of about 1,609 individuals), while annual number enrolled on the second cycle was down 38.8 per cent (corresponding to 75,617 individuals at an annual average decrease of about 7,561 individuals), compared with an increase of 30.3 per cent in the first cycle (corresponding to 49,228 individuals at an annual average growth of about 4,923 individuals).

Table 5. Higher education enrolled, by level (2006/07 to 2015/16)

Degree	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
First cycle	162,448	230,077	244,085	253,316	255,523	246,211	231,528	220,859	212,526	211,676
Second cycle	194,696	135,496	115,488	113,934	122,452	124,849	120,001	121,096	117,272	119,079
Third cycle	9,585	11,344	13,429	16,377	18,293	19,213	19,471	20,245	19,860	25,644
Total	366,729	376,917	373,002	383,627	396,268	390,273	371,000	362,200	349,658	356,399

Source: Adaptation of [10]

Table 6 displays the evolution of graduates by level of education from the academic year of 2006/07 to 2014/15, proving a notable increase of the graduates with the third cycle - doctor (*Doutoramento*) and the first cycle - bachelor (*Licenciatura*), which registered rates of 207.2% and 57.6% respectively. On the other hand, there is a 26.6% decrease of the graduates with the second cycle - master (*Mestrado*), which shows that, in the space of nine years, the number of graduates with this type of training dropped 13,793 registrations. Thus, in addition to the growth of the number of graduates of PhD courses, the importance of high-level formation is highlighted by the importance that this specific formation has been gaining in the Portuguese panorama. In fact, if in 2006/07, doctorates accounted for only 1.5% of the total number of graduates; in 2014/15 they represent 4.4%, evidencing a significant average annual growth rate of 23.0%.

Table 6. Graduate, by level (2006/07 to 2014/15)

Degree	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
First cycle	30,147	44,718	44,098	51,252	51,539	51,019	51,508	47,622	47,511
Second cycle	51,860	38,006	31,202	25,943	33,505	40,368	39,204	36,873	38,067
Third cycle	1,269	1,285	1,267	1,414	2,085	2,877	4,155	4,008	3,898
Total	83,276	84,009	76,567	78,609	87,129	94,264	94,867	88,503	89,476

Source: Adaptation of [10]

From the analysis of the graduates by scientific area, considering the areas defined by the National Classification of Education and Training Areas approved by Administrative Rule n° 256/2005 of March 16 [20], and identified in the Table 7 for the period 2006/07 to 2014/15, the "Social Sciences, Commerce and Law" area contributes, in each year, to the largest number of graduates, with values that exceed 29% of annual graduates, even though, over the years, there have been some oscillations. In 2011/12 there was the highest annual increase in the number of graduates (3,553), following the positive trend of 2010/11. However, it was in 2013/14 that there was the greatest loss of graduates in this area (2353 students). The second area that concentrates more graduates is "Health and Social Protection", in which more than 19% of the higher education graduates are from this area, although the between the academic year of 2006/07 and 2014/15, number of graduates of this area has decreased 5.5%. In addition, the "Technology" area occupies the third place in the ranking of courses with the highest number of graduates (more that 18% of annual graduates).

Table 7. Graduates, by scientific area (2006/07 to 2014/15)

Scientific area	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
Education	7,260	5,398	4,716	6,801	7,748	9,791	8,560	7,357	7,132
Arts and Humanities	7,106	7,474	6,317	6,458	7,052	7,837	8,566	8,022	7,848
Social Sciences, Commerce and Law	25,122	23,525	22,487	23,012	26,128	29,681	29,304	26,951	27,835
Science, Mathematics and Informatics	5,308	6,294	5,352	5,139	6,064	6,942	7,500	7,014	7,151
Technology	15,658	17,037	15,018	14,412	15,377	16,635	17,252	16,446	16,438
Agriculture	1,419	2,046	1,471	1,259	1,408	1,191	1,419	1,466	1,610
Health and Social Protection	16,583	17,398	16,224	16,387	17,793	16,515	16,318	15,491	15,666
Services	4,820	4,837	4,982	5,141	5,559	5,672	5,948	5,748	5,775
Other	-	-	-	-	-	-	-	8	21
Total	83,276	84,009	76,567	78,609	87,129	94,264	94,867	88,503	89,476

Source: Adaptation of [21]

Table 8 illustrates the higher education graduates by scientific area and gender on the academic year of 2014/15 (last year available). As expected, the areas of "Technology" and "Services" concentrated the greater number of male graduates, while the female graduates prefer courses of the "Education" area, following by the courses of "Health and Social Protection", "Agriculture" and "Social sciences and Law" areas. The data shows that women remain a minority in the "Technology" area, but on the other hand evidence shows that men are more likely to be amongst the poorest performers in reading ability ("Education" area). As argues the Education, Audiovisual and Culture Executive Agency (EACEA), these two examples illustrate that gender differences in education must be taken into account when developing policies and strategies to improve educational outcomes [22].

Table 8. Graduates, by scientific area and gender (2014/15)

Scientific area	Men	Women	Total
Education	1,301	5,831	7,132
Arts and Humanities	3,063	4,785	7,848
Social Sciences, Commerce and Law	10,522	17,313	27,835
Science, Mathematics and Informatics	3,140	4,011	7,151
Technology	11,117	5,321	16,438
Agriculture	602	1,008	1,610
Health and Social Protection	3,357	12,309	15,666
Services	3,065	2,710	5,775
Other	4	17	21
Total	36,171	53,305	89,476

Source: Adaptation of [21]

Table 9 shows that, after the implementation of the Bologna process, the number of courses on the higher education grew by 17.79% between 2006/07 and 2011/12, directly influenced by the polytechnic subsystem (more 60.22%); after this year the number of courses on the higher education institutions decreased 19.53%, translating a global decrease of 5.21% in the last decade, directly influenced by the university subsystem (less 22.42%). However, in the academic year of 2005/06, before the implementation of the Bologna process, the total number of degrees was 622 in different fields of scientific knowledge and makes it available for each of the higher education institutions in a specific sub-system [6]. Indeed, after the implementation of Bologna process, in parallel with general courses such as medicine, architecture, management, economics, mathematics and law, we witnessed the appearance of a large number of courses with a high specificity, such as Euro-Atlantic studies, Portuguese studies, marine sciences, accounting or finance.

Table 9. Courses in the higher education system, by subsystem (2006/07 to 2015/16)

Subsystem	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
University	611	525	534	486	597	564	557	550	498	474
Polytechnic	367	525	541	614	519	588	565	537	477	453
Total	978	1,050	1,075	1,100	1,116	1,152	1,122	1,087	975	927

Source: Adaptation of [23]

In sum, the Bologna process has exercising influence and largely determining the political agenda of higher education system [14]. The higher education institutions need to embrace the Bologna Process as an opportunity to develop the right kind of institutional capacity to interpret and realize the reforms, exploiting creativity and available synergies as well as managing conflicting goals and values to ensure the success of each institution [24].

4 CONCLUSIONS

In Portugal the higher education includes universities (based on research and theory, like courses as medicine, law and economics) and polytechnics (based on practical training, like courses as nursing, accountant and teaching), offered by public and private institutions, subject to the previous recognition of the Ministry of Science, Technology and Higher Education. Following the European trend, the Portuguese higher education system is based on three cycles of studies: first cycle - bachelor (Licenciatura), second cycle - master (*Mestrado*), and third cycle - doctor (*Doutoramento*). The first and second cycle are conferred by both university and polytechnic institutions, while the third cycle is only conferred by university institutions.

The research provides empirical evidence about the Portuguese higher education institutions engagement in the Bologna process, specifically: (1) the number of higher education graduates

increased, following the trend in the European Union member states; (2) the school success occurs mainly in the female gender; (3) the third cycle (corresponding to doctoral courses) presents the most significant growth; (4) the areas of "Technology" and "Services" concentrate the greater number of male graduates, while the female graduates preferred courses of the "Education" area; and (5) after the implementation of Bologna process, appears a large number of courses with a high specialization. In the future, the Portuguese institutions must to emphasize the life-long learning and continue to support the European higher education area.

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