Distance higher education in Portugal
A disruptive strategy

PAULO BENTO & HELENA PINTO DE SOUSA[1]

ABSTRACT: This paper looks into distance higher education (DHE) in Portugal and aims to devise an alternative strategy for its development. The proposed strategy results from a thorough analysis of DHE, preceded by a general appraisal of higher education (HE) and of the country itself, through which the following key conclusions were reached: as a consequence of timid or unsuccessful initiatives led by traditional universities, DHE in Portugal almost coincides with Universidade Aberta (UAb, the open university); amongst the challenges that HE faces, DHE represents a window of opportunities; by repeatedly putting off structural reforms, the country is currently experiencing one of the most dramatic moments in its history. As an alternative to continuity, namely HE institutions following independent paths, coopetition stands out as a more beneficial route as it would be able to bring alignment and to generate synergies. A disruptive strategy in which UAb plays a central role is thus proposed.

Key words: Distance Higher Education, Coopetition, Strategy

TÍTULO: Ensino Superior a distância em Portugal: Uma estratégia disruptiva

RESUMO: O presente artigo aborda o ensino superior a distância (ESaD) em Portugal e tem como objetivo a definição de uma estratégia alternativa para o seu desenvolvimento. A estratégia preconizada decorre de uma análise cuidada do ESaD, antecedida por uma apreciação geral do ensino superior e do país, através das quais se concluiu nomeadamente o seguinte: em resultado das iniciativas tímidas ou mal sucedidas das universidades tradicionais, o ESaD quase se confunde com a Universidade Aberta (UAb); entre os vários desafios colocados ao ensino superior, o ESaD representa uma janela de oportunidades; o país, ao adiar sucessivamente reformas estruturais, vive hoje um dos momentos mais dramáticos da sua história. Em alternativa à continuidade, com trajetórias independentes por parte das instituições do ensino superior,

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afigura-se mais profícua a via da coopetição, aglutinadora e potenciadora de sinergias, propondo-se a adoção de uma estratégia disruptiva, na qual a UAb tem um papel central.

INTRODUCTION

This paper addresses distance higher education (DHE) in Portugal and proposes a strategy for a significant leap in its development. The underlying but perhaps naïve premise is that the public higher education network (PHEN) should be effective and efficient, subject to the country's sustainable development and free from private interests, inside or outside the PHEN.

The way societies have generated, managed and disseminated knowledge has evolved over time. Relatively recent phenomena transformed knowledge into the strategic resource of modern development. The world has become knowledge intensive, and information and communication technologies (ICT) are at the center of the mutation.

Education cannot ignore such changes and, in addition to assimilating ICT, it is the teaching that has to rethink its ways. Changes must not be merely cosmetic. They must be deep, driven towards intelligibility and more cooperation, flexibility, interactivity and attractiveness. Gone are the days when custody and, above all, transmission of knowledge were the monopoly of a fringe of society, circulating in higher education institutions (HEI) and acting egocentrically. Besides potential hazards to the school system, we are faced with a historic opportunity that involves claiming a decisive role in generalizing access to knowledge. Distance education (DE) will play a prominent role in this process, in a way that had not been witnessed until the beginning of this millennium.

Bielschowsky et al. (2009) concluded in their report that DHE in Portugal was far from making a desirable contribution to bridging the gap between the PHEN and its full potential, thus helping the country's development. The authors suggested a number of measures to increase that contribution. However, the country's extremely serious situation entails further analysis as the report failed to take this into consideration and is somewhat abstract.

This paper aims to identify and deepen possible development scenarios for DHE in Portugal, adopting an alternative approach and providing effective responses to the strategic formulation of Universidade Aberta (UAb) itself. The history of DHE (and DE) in Portugal is intertwined with UAb's own history. Unsurprisingly, UAb thus plays a pivotal role in developing the proposed strategy for DHE.

The lifelong learning[2] and technological specialization courses[3] available at some HEI, especially in polytechnics, are deliberately ignored in this article; despite growing interest (the number of enrolled students increased from 300 in 2004/05 to almost 6,000 in 2008/09), they continue to be of little importance in the context of the total supply provided by HEI (in 2008/09 they represented only about 1/60 of all students enrolled).

As the article will show, the answer to the challenge is not the use of conventional strategy tools, nor a time horizon of three to five years. The time perspective should be broadened and the problem of higher education (HE) should be refocused, giving DHE a decisive role.

Since this article has its origin in the subset of a much wider unpublished study, it is important to mention that aspects of that study inevitably influence the following sections, notably focus interviews (conducted with UAb employees) and a survey on DE (2860 valid responses).

Besides this introduction, the article has five sections. The next section provides an overview of DE. The third section presents a brief analysis of the country's political, economic, social and technological dimensions insofar as they influence DHE. The fourth and fifth sections offer a brief characterization of HE in Portugal: the former summarizes supply and demand while the latter focuses only on DE. The last section questions possible evolutions of DHE in Portugal and proposes a strategy that breaks with the past, changing the paradigm of DHE.

DISTANCE EDUCATION

It is not for this paper to analyze DE in depth. Dissecting its history, assessing its use around the world, discussing its virtues and questioning its limitations are complex issues that are the object of extensive and dedicated research forums. However, a minimum context must be given to frame the proposed way forward of DHE in Portugal.

Definition

A possible definition of DE is suggested by Schlosser and Simonson, cited by Simonson et al. (2009, p. 7): "institution-based, formal education where interactive telecommunications systems are used to connect learners, resources, and instructors." This perhaps simplistic definition provides the key elements that characterize DE:

• Support, planning and preparation of materials undertaken by an organization dedicated to education (as opposed to individualized teaching or self-learning);

• Separation between teacher and student, both in terms of their location, and possibly the time frame in which the transmission and reception of knowledge occur (as opposed to classroom teaching);

• Use of bidirectional communication technologies between teacher and student (as opposed to technologies that do not allow dialogue, such as those used in correspondence learning);

• Enhancement of learning through the connection of students, teachers and resources (the development and availability of resources are subject to specific procedures, in order to create a complete learning experience).

History

According to Halverson (2009), the first generation of DE dates back to the nineteenth century: it was based on correspondence learning, in which the instructor would use the postal service to send reading materials and questions for the student to work on. The student's work would then be mailed back to the instructor for assessment.

The second generation of DE is placed approximately between the 1940's and 1980's[4]. During this period, DE evolved through the use of other means of knowledge transmission, such as films, television and radio. However, the main philosophy did not change insofar as unidirectional, asynchronous communication persisted, by use of a static medium (postal service) for sending and receiving materials, assignments and results.

This state of affairs only changed from the 1980s onwards with the advent of the Internet, giving rise to the third generation of DE, which is still far from stabilized. This is the generation of interactivity, catalyzed by an array of new technologies, able to ensure communication between individuals, in real-time, regardless of their physical distance.

These new technologies allow not only a strong proximity between teacher and student, but also between students. Additionally, they enable a new approach to the production, storage and delivery of materials, with clear impacts in teaching methods. In

fact, the third generation of DE has the ability to transform itself into a substitute for classroom education – for example, it is possible to create a virtual classroom in real--time.

Interestingly, classroom education has an increasing component of autonomous work, and blended learning[5] is also on the agenda. It is not just DE that seeks to extract and utilize the advantages of classroom education, but also the reverse. Indeed, barriers between the two types of education are fading, highlighting the possibility of bringing out the best that each has to offer, to the benefit of the process and the learning experience. In short, the virtues of DE methodologies and technologies are beginning to be recognized, elevating its status from "poor relation" to "direct competitor" of classroom education[6].

Delivery

Thanks to the popularization of ICT, DE is nowadays seen for the first time as a modern and appealing approach to education. Some authors, however, argue that even when DE is based on the most modern ICT, it cannot eliminate its alleged disadvantage compared to traditional face-to-face classroom methods. They argue that the technology "per se" is not sufficient to bring about change, i.e., that new processes and methodologies are required using technology that is not the essence, but merely the catalyst.

Authors like Simonson et al. (2009) assert that the key to the success of DE rests with its structure, its development approach and its knowledge transmission methodology, rather than with geography or (a)synchronization. They reason that DE is a powerful idea that can change the concept of education. Nevertheless, this will only happen if the distance learner's experience is as rewarding and complete as that of the classroom student.

The specific way in which the future of DE will be shaped by ICT is impossible to predict, but it does not seem risky to foresee interactive classrooms, on-demand contents and customized, student-centered materials, for example. However, the real evolution will depend both on technological availability and the user skills of the target audience, so that the resources offered by the school can be effectively used.

Lastly, it should be noted that ICT are a two-way street: on the one hand they make it possible to reach previously inaccessible students; on the other hand, they open the doors to a wider competitive space, since the absence of need for physical movement creates the opportunity to attend a program at another "location", at another school system, or in another language.

Open education

As a result of the aforementioned technological evolution, open education is now an inescapable reality, taken very seriously by some of the world's most prestigious universities – MIT is an excellent example[7]. This approach is obviously not unique to traditional universities. Several DE universities have already accepted it (United Kingdom, Israel, Japan, etc.)[8]. This is not unexpected inasmuch as open education is provided at a distance and, for the purpose of this article, considered as a special approach to DE, involving broad and open access to support materials, and allowing for a choice of content, methodologies, technologies and assessment method.

A key strategic issue that open education faces is the extent to which the availability and mass consumption of knowledge may radically change the learning process as it addresses specific needs and requirements better, resulting in the customization of the production of knowledge. It is expected that open learning platforms will cease to be a differentiation factor for the HEI that promote them, and instead become a requirement and a basic HEI selection criterion for the student.

Quality

It is further appropriate to make a brief reference to quality in DE, given that, rightly or not, this is central to the stigma that (still) exists around this type of education. Indeed, the accreditation of DE programs is essential to building credibility for the institutions that provide them, thus clearing all possible associations with "diploma factories"[9].

All around the world, there is a trend towards certification of DE programs and institutions, as indeed happens with education in general. In addition to its intrinsic advantages, this trend, which is mainly characteristic of HE, also functions as a differentiation factor for the various DE stakeholders.

PORTUGAL: A COUNTRY IN TROUBLE

This section provides a brief analysis of Portugal's political, economic, social and technological situation. This is deliberately not a comprehensive analysis, focusing only on those aspects that are considered relevant to determining the future of DHE in Portugal.

Political

The political context in Portugal has been characterized by relative government stability. However, and despite evident progress, the various governments have not carried out the necessary structural reforms over the last decade, leading the country to

one of the most difficult moments in its history, ultimately becoming dependent on foreign aid and intervention (IMF and EU). It is against this backdrop, indissociable from the respective European setting, that the political trend over the last decade in terms of HE and particularly DHE is presented.

The first relevant event was the Lisbon Strategy, which set a goal for the EU "to become the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social Cohesion"[10]. In 2005, the so-called Wim Kok report concluded that progress achieved so far was clearly insufficient and recommended: 1) the refocus of the Lisbon Strategy on growth and employment objectives; 2) the appropriation of the reform agenda by Member States through specific programs for implementation at national level.

In the Portuguese case, several structural problems prevented the full development of the Lisbon Strategy. Specifically, the PHEN was not prepared to meet the challenges. Indeed, under the system revision carried out by the OECD between 2006 and 2007, key issues of various natures were identified: underfunding of institutions and students, lack of institutional autonomy, inefficient and ineffective governance, imperfections of the binary system, low quality of education and incipiency of R&D. Special emphasis is also given to the country's poor performance in terms of inbreeding (OECD, 2007).

Furthermore, a study commissioned by the MCTES[11] and conducted by international experts concluded that DHE was far from making a desirable contribution for HE to reach its full potential. Therefore, and in order to position DHE as a catalyst for the country's objectives, Bielschowsky et al. (2009) suggested the following:
• Enlargement of DHE up to fourfold, depending on the human, technical and financial resources that could be mobilized for this purpose;
• More research on DHE, to ensure appropriate support for the transition to an educational system with greater DHE weight;
• Specific efforts towards accreditation and quality assurance of DHE programs;
• Leadership from UAb (as the only institution specialized in DHE), but not a monopolistic position;
• Definition of a dedicated financing system for DHE, scrapping the current method that consists of allocating a percentage of the overall HE budget to UAb.

Following these recommendations, the eighteenth Government program[12] set down its commitment to relaunch DHE in Portugal and the Portuguese-speaking world until the end of its term of office by increasing the number of enrolled students

fourfold. The alleged commitment was extended to the PHEN in general, as derives from the "Higher Education Trust Agreement"[13], signed in 2010 between the Government and the HEI – 14 universities and 19 polytechnics. This contract, which included the foundations of the HE development program for 2010-2013 and involved an additional budget allocation of €100 million, was eventually breached by the government supposedly because of poor public finances. This final outcome was, however, consistent with the recent public investment in education: budget execution, as a percentage of GDP, has decreased since 2002[14]. In a context of modest GDP growth and from a strategic or long-term perspective, the governments' option is even more alarming.

A final highlight should be given to the approval of Europe 2020[15], in June 2010. The European strategy embraces three strategic priorities (smart growth, sustainable growth and inclusive growth), embodied in five targets: 1) 75% of the population aged between 20 and 64 years should be employed; 2) 3% of the EU's GDP should be invested in R&D; 3) goals on climate / energy "20/20/20" must be met (including an increase to a 30% goal for greenhouse gas emission reductions, should conditions permit), 4) the drop-out rates of early school students should be under 10% and at least 40% of 30 to 34 year-olds should have third level education; 5) 20 million fewer people should be at risk of poverty and social exclusion.

The Europe 2020 strategy reportedly incorporates the impact of the international crisis, which despite having been triggered by the U.S. subprime mortgage crisis, found a guardhouse in the European sovereign debt crisis. The breadth and depth of the impacts on the EU are far from being exhausted and quantified, so a repetition of what happened with the Lisbon Strategy is not altogether improbable. Accordingly, it is reasonable to think that HE in general and DHE in particular will tend to develop along other patterns, short of projected goals and resources, but giving priority to efficiency.

Economic

The international crisis, evident since the summer of 2007, coupled with the opening of the Portuguese economy and above all with repeated postponements of structural reforms have led the country into a very serious situation, forcing it to resort to international aid. Some dub the new millennium the "lost decade": second slowest economic growth (amongst countries at peace) with weak records on competitiveness, employment, public accounts and in society in general[16].

The Portuguese economy was sluggish throughout the last decade (6.47% growth in total – only Italy did worse), in contrast to the previous decade, which had been

one of convergence with the EU. The only year in which Portugal did not diverge from the EU was 2009, when the crisis began to be felt in other Member States[17]. The main international organizations predict that in the medium term the country will continue to show mediocre growth rates and to diverge from the EU, which should grow twice as much as Portugal.

In terms of unemployment, Portugal reached a 25-year peak[18] with all-time highs looming in the near future. The prospects are not good for labor legislation, national qualifications and globalization, traditionally described as major inhibitors of investment, particularly in innovative projects, which in turn are seen as regenerating and promoters of competitiveness gains. Apart from the obvious social consequences, unemployment has a significant impact on public accounts, hindering their equilibrium.

The economic and financial situation of the country therefore leads to a certain duality in the conclusions to be drawn about its impact on the revamp of HE in general and DHE in particular. On the one hand it does not seem to allow for the desirable public investment. On the other hand, real education and qualification levels of the population are central ingredients of economic growth and social progress. As the pillars of sustainable development, they are more an imperative than an option. Given that DE stands on the lower spectrum as far as costs per student are concerned, it is equipped to become a key tool for the structural improvement of the educational level of the population's most significant groups.

Social

The analysis of the social environment that is presented in this article is necessarily brief. Given the scope of the article, emphasis is placed on educative, rather than cultural, demographic, or other citizenship topics.

In Portugal more than two thirds of the working population have no schooling at all or only have the basic level (currently the 9th grade)[19]. Even though the dropout rate decreased from 42.7% to 31.2%[20] in the last decade, it remained the highest among OECD countries [OECD (2006-b) and OECD (2010)]. As a result, the number of students who finish high school and are then admitted to HEI remains very low, causing the country to consistently exhibit one of the lowest numbers of graduates in the EU (United Nations, 2009).

Table 1 (see appendices) shows that in the last decade there was an increase in individuals with HE, across all categories. Nevertheless, and in spite of improvement, qualification and education levels are still fatally low. This scenario has direct conse-

quences on unemployment, preventing the active population from being resourced into sectors that are higher value added, knowledge-intensive or based on new technologies.

Table 1 also gives account of the increase in graduate unemployment. However, this information should be interpreted with caution. Table 2 (see appendices) shows that there are large differences between different areas of study: 1) the contribution of each area for graduate unemployment ranges from 0.1% in Transportation Services to 17.5% in Business Studies; 2) the relative share in the number of graduates ranges from 0.1% in Transportation Services to 16.2% in Business Studies; 3) unemployment rates range from 2.3% in Security Services to 10.7% in Social Services and stand at 4% in Transportation Services and 5.5% in Business Studies.

Thus, "increasing the academic and professional qualifications of the Portuguese society continues to be an essential factor for economic, social and technological modernization. Contrary to what is sometimes affirmed, Portugal does not have too many graduates, but actually has too few"(OECD, 2006-b). This means that it is necessary to challenge the rhetoric, to identify areas of study that enhance the effective development of the country and to have the courage to focus scarce resources in those areas.

Technological

A picture of the innovation performance within the EU27 shows a general improvement over the last decade with few exceptions; according to the innovation union scoreboard 2010, Portugal has experienced the fastest growth in performance over a five-year period, for a composite indicator obtained by an appropriate aggregation of 24 indicators[21]. Portugal has been progressing well in terms of technology. However, within the EU27, it remains as part of the "moderate innovator" group, placed between "followers" and "modest". The "leaders" are Sweden, Denmark, Finland and Germany.

Portugal's effort is also witnessed upstream, as the proportion of researchers to the total workforce recently exceeded the EU27 the average EU27 and investment in R&D as a percentage of GDP increased (although this is still below the EU27 average)[22].

As previously noted, the delivery of DHE was strongly facilitated and extended by developments in ICT, which, as was pointed out, require that users possess the necessary skills to benefit from them. Taking computer usage, Internet usage and broadband access as proxies for the readiness of DHE potential recipients (resident in

Portugal), the overall picture is positive or at least not preventive of DHE development. Indeed, as Graphs 1 and 2 illustrate, computer and Internet usage have increased over the last decade at all levels of education, bordering on 100% in HE and 90% in secondary education. In addition, the number of households with broadband access has expanded over the last 5 years, with penetration rates rising from 10% to 30% in low populated areas, from 15% to 45% in moderately populated areas and from 25% to 55% in densely populated areas[23].

GRAPH 1

Use of computer, by education level
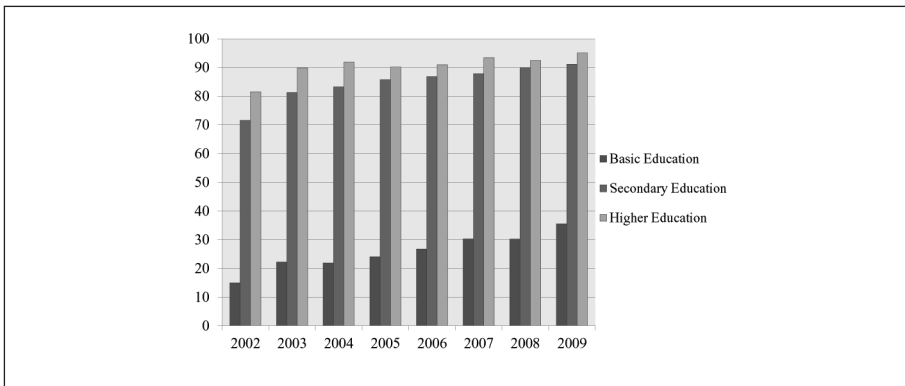
Source: Pordata

GRAPH 2

Use of internet, by education level
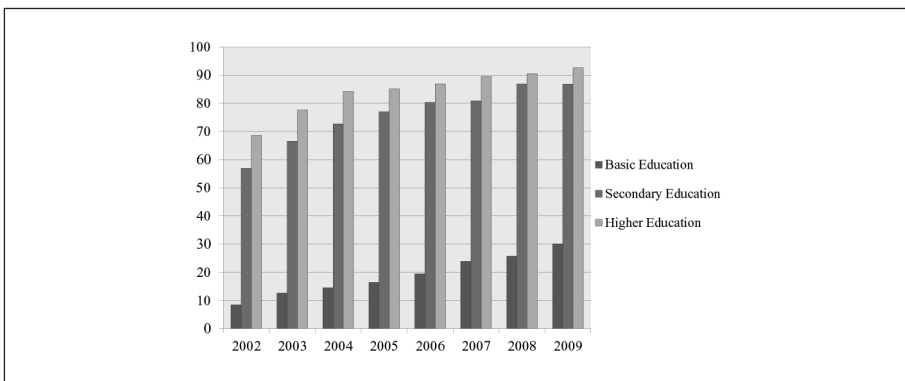
Source: Pordata

HIGHER EDUCATION IN PORTUGAL

The Portuguese education system is structured around four main blocks (Pre-primary Education, Basic Education, Secondary Education and Higher Education).

HE is organized into a binary system, with a university subsystem and a polytechnic subsystem, where the latter reveals a fairly comprehensive geographical coverage[24]. This is a common system in Europe, even though there are subtle differences across countries. In the Portuguese case, the role of HEI is well defined in the RJIES[25]. However, a certain academic drift[26] is latent, with the polytechnic institutes attempting to mimic universities, which are considered more prestigious. An example of this is implicit in the polytechnics announcement of the creation of a network of applied research centers[27], a "natural ground" for universities.

In terms of PHEN, classroom teaching is clearly dominant and DHE only represents approximately 3% of the number of students (Bielschowsky et al., 2009).

Demand
Table 3 (see appendices) shows that the number of students enrolled in HE in Portugal declined slightly over the last decade, contrary to the first three promising years. This trend is explained more by university education than polytechnic education and more by private schools than public schools.

Table 4 (see appendices), analyzes HE first year students (first grade, first time) and does not fully corroborate the previous trend. To begin with, the Bologna process, which reduced degree duration by one or two years, inherently changed students' average length of stay in the system. The data in the two tables should therefore be analyzed simultaneously.

Differences across various areas of study should also be emphasized. Table 5 (see appendices) presents the data in Table 4 by area of study and highlights the following: 1) Education diverges completely from the other areas, losing about 50% of the students, 2) Agriculture has a weak evolution, when compared with other areas.

Considering the political and economic analyses in the previous section, it is unlikely that the number of students in HE will increase over the coming years. However, the social and technological analyses open the door for that development, via DHE.

Supply

In 2010, Portugal had 296 HEI, 9.8% less than in 2005. Over this period the number of private HEI fell 16.0%, to represent 42.6% of the total (against 45.7% in 2005)[28]. To a certain extent, this fact supports the reduction in the number of students and the transfer of a share of them to the PHEN, partly restoring public education to its former weight.

Despite expected resistance, it is anticipated that the PHEN may go through a consolidation or rationalization process in the near future. It is unlikely that private HE will be able to reverse the trend due to two crucial factors: 1) strong entry barriers pertaining to a highly regulated sector and 2) the economic outlook does not favor an improvement in the financial situation of families.

DISTANCE HIGHER EDUCATION IN PORTUGAL

This section briefly portrays DHE in Portugal, giving prominence to UAb, since it accounts for more than 90% of the total students enrolled in formal DE. This is suggestive of the difficulties that other HEI have encountered to position themselves in this form of education.

Universidade Aberta

This subsection summarizes UAb's evolution before and after 2006, which is not only the turning point in the life of the organization but also of historical significance in terms of DHE. A brief analysis of UAb's educational offer and target audience close this subsection.

1988-2006 – Brief history

UAb is a public university dedicated to DE, which was established in 1988. It originated in the Portuguese Institute of Distance Education and the Institute for Multimedia Communication, which are still patent in its organizational culture(s). Going further back, the roots of UAb are inseparable from "telescola", a television-based education system established in 1964 to overcome the shortage of teachers, given the need to increase compulsory education from 4 to 6 years.

Up until 2006, UAb worked under a self-learning pedagogical model, based on content conveyed through written manuals, videotapes and audiocassettes, later followed by radio and television programs. Students could contact their tutors by phone at predetermined times or they could use the existing support centers in district capitals. Admission to a written exam (taken at a testing facility) would occur when the student was deemed ready. All learning was individual and there was no concept of class.

2006-2010 – Evolution

With the adoption of a new strategic plan for UAb, 2006 marked the beginning of a restructuring process that included innovation in teaching and the definition of a virtual pedagogical model. Without abandoning individual learning, students gained access to a collective learning model, becoming part of a virtual class where student--student relationships also became possible. This interaction is based on a technological platform designed specifically for educational purposes, as well as other network resources, such as e-portfolios, Blogs and Wikis.

2007 was important for several reasons: it was the first year of full implementation of the virtual pedagogical model, the Distance Education Laboratory was created and courses were adjusted according to the Bologna process. Moreover, the RJIES confirmed UAb's special status and established that DE would be regulated by a special law (which ultimately failed to happen).

In 2008, the new statutes of UAb were approved, providing new bases for its restructuring. Mention should also be made of the creation of the network of CLA[29] by changing and enhancing previous support centers.

2009 stood out as a particularly promising year for UAb since, as previously noted, the government committed to relaunching DHE in Portugal and the Portuguese--speaking world by the end of the term of office.

In 2010, UAb was operating a pedagogical model that was structured according to some of the best international practices, it had deepened its decentralization by consolidating the network of CLA, it continued to intervene in the Portuguese-speaking space and the majority of its HE programs were accredited or undergoing accreditation.

Educational offer and target audience

As far as the educational offer is concerned, profound changes were operated between the 2005/06 and 2010/11 school years. These changes were largely the result of implementing the Bologna Process and the new virtual pedagogical model.

As a result of its history, statutes and its very nature, UAb has focused its activities in the fields of Humanities, Social Sciences and Education Sciences, playing a relevant role in the training of instructors. In recent years, there was a clear shift towards management, which now represents over 50% of Social Science students. Technology and Exact Sciences have also had some relevance.

UAb not only offers programs in the 1st, 2nd and 3rd cycles, but is also strong on non-formal education. As an example, the main 1st cycle programs are presented (number of students enrolled in 2010/11 in parentheses): Social Sciences (3377); Management (1826); History (640), Computer Science (508); Languages, Literatures and Cultures – Portuguese Studies (368); European Studies (289); Education (260); and Information and Documentation Science (199)[30]. Regarding the 2nd cycle, the supply in 2010/11 included 8 programs in Social Sciences and Management, 6 in Education and Distance Learning, 5 in Humanities and 4 in Science and Technology[31]. In terms of 3rd cycle in 2010/11, 4 programs were offered (Education, Portuguese Studies, History and Social Sustainability and Development)[32].

As far as the target audience is concerned, over time UAb took the mission of educating students who in the past had been unable to begin or complete HE, while also looking to reach out to those who already had HE degrees and intended to update or convert them. The typical student profile at the beginning of the millennium was the following: living in Portugal (around 85%) or in a Portuguese Speaking African Country (14%), slightly below the age of 40 and predominantly employed by others, mainly in the public sector or equivalent.

For the purpose of admission into the 1st cycle, UAb is not part of the national contest for access to higher education and has no numerus clausus. However, it is only allowed to admit students above the age of 21 (or above 18 and benefiting from student-worker status since the age of 16). There are no limitations for the 2nd and 3rd cycles. The share of 1st cycle students tends to be slightly above 90%, while 2nd cycle students are approximately four times as many as 3rd cycle students.

Other high education institutions
In 2006/07, apart from UAb, only the Institute of Statistics and Information Management and the Institute of Bank Management were offering DHE[33]. In 2010/11, the University of Aveiro and three polytechnics made DHE available, in some cases with disappointing results.

Nowadays, there are other HEI that provide DE training, but they do not award an academic degree (e.g. University of Coimbra). The focus of polytechnics looks strong, so much so that the CCISP[34] announced the creation of the "e-polytechnic", a DE platform shared by its members, with a view to broadening the supply of DE and simultaneously reducing costs. Nevertheless, universities doubt that this project will materialize in the near future.

DISRUPTIVE STRATEGY

At this juncture, progress must be made towards the advisable DHE strategy in Portugal, which is the ultimate purpose of this article. Considering the afore-mentioned, it is not surprising that UAb will be assigned a pivotal role in this strategy, due to its history and the way this merges with that of DE and because it remains the only HEI that specializes in this type of education. In addition, the new DHE strategy will have to be seen in light of other changes in HE as a whole.

Although HE has peculiar characteristics that justify its regulation, a traditional analysis suggests this is an unattractive sector (decreasing number of students com-pleting secondary education, declining public funding per student, bankruptcy and mergers of institutions, etc.). Typically, the players leaving the industry outnumber the entrants, resulting in fratricidal disputes between those who are left to compete in the market.

The conventional deterministic view that the competitive structure of the industry and the market are predefined and that the organization is doomed to be aligned with best practices must be abandoned. A truly promising strategy, capable of operating sustainable and significant developments, is dependent on a paradigm shift, which justifies a preliminary note. This section then proceeds with the guidelines that mate-rialize this abandonment, which may lead DHE in Portugal to a new level, as they provide greater value at a lower cost.

Paradigm shift
The roots of strategy are allegedly in the ancient "Art of War", in which oppo-nents fought for territory that was limited. However, some authors have suggested that organizations in a particular sector or industry should rather consider that the territory in which they compete is not a constant and that the general environment is in permanent transformation, changing the rules of the game and the players on the field (Kim and Mauborgne, 2005). This is a new paradigm, followed by a grow-ing number of organizations, which must also be considered in terms of public po-licy.

Focusing on the industry and seeking to beat competitors by stealing their market share can be very appealing, an imperative mainstream recommendation, but it makes less and less sense as the boundaries of the industry are not given. They are dynamic, by virtue of its players' actions and also as a result of the influence from other players and the general environment.

Indeed, it seems advisable for organizations to move from excessive concentration on competitors and focus instead on predicting and understanding macro and micro trends that affect them the most, thereby anticipating change. This is especially true in industries that are more influenced by some of the driving forces that shape today's world: 1) technological advances that help increase productivity, occasionally contributing to supply surpluses; 2) the increasing commoditization of goods and services, which has caused price wars to proliferate and has reduced profit margins[35]; 3) the dismantling of barriers between regions or countries and the availability of real time information on products and services, causing borders between them to fade as well.

On the other hand, over the years many strategies have been defined based on best practices, creating a sort of obsession to imitate success stories (many of which owe their label to gross errors in the analysis[36], to the halo effect or to hidden reasons). It is obviously useful to possess a good knowledge of the industry and the market as a starting point, in order to understand where competitors are investing for example, and what the main industry drivers are. However, it is essential to go beyond the usual benchmarking and typical strategies.

Recently, another idea has gained strength: that the industry or the organization is not the best unit of analysis to sow something prolific, but the strategic move in itself is. It is the set of decisions and actions associated with the creation of a new prominent space that deserves the attention of organizations and enables them to achieve outstanding performance sustainably.

The touchstone for this movement, which allows the creation of a new space, consists of a better alignment between innovation, utility, price and cost. It removes one of the dogmas associated with the traditional approach, based on competition: the trade-off between cost and value. For most managers, providing value requires a high cost and consequently a high price. Therefore, if prices must be lowered, then cutbacks in value and costs are compulsory. Simply put, the challenge is to provide more value at a lower cost, which requires the company to provide something that the industry (usually) does not, while reducing or eliminating some of the cost components that are key to the industry.

While strategies outside the mainstream may have fewer tools available and raise the specter of unpredictability, there are tools that allow the formulation and development of a strategy with (some) security. One of the tools involves a simple procedure, which consists of answering the following questions: 1) what are the factors that the industry takes for granted and that can be eliminated or at least reduced below industry stan-

dards?; 2) what factors have never been taken into consideration by the industry that may be offered or made available and should be elevated to a higher standard?

Answering the above questions is an essential and challenging process in designing a disruptive strategy, but there are examples of those who have consistently achieved this for more than two decades (Southwest Airlines, Cirque du Soleil, Casella Wines, WL Gore & Associates, etc.).

Current model

Currently, the prevailing DE model for the PHEN in Portugal (see Figure 1) is characterized by an overwhelming dominance of UAb, accompanied by small initiatives from other universities that create units of DE with very specific purposes, in very precise scientific areas. In some cases, there is cooperation between UAb and these units, based on know-how and technology sharing.

From a strategic standpoint, this model is exhausted and has two possible developments which, for the benefit of structure, have been denominated "partnership" and

FIGURE 1

Public DHE in Portugal – 2010
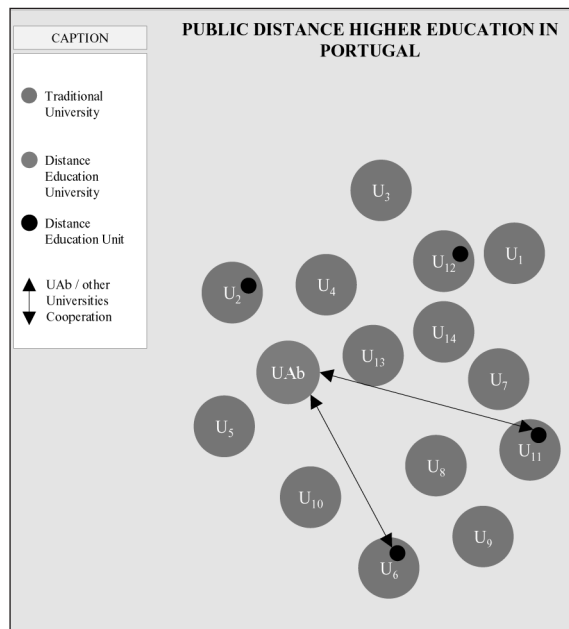
Source: Authors

"coopetition"[37]. As explained below, the solution calls for coopetition, given that a partnership does not appear sustainable.

Despite the phenomenal growth of DE, there are two conflicting pressures within the framework for its future development. According to Simonson et al. (2009), on the one hand the first choice of students or applicants is not DE. On the other hand, these individuals are very demanding with regard to distance learning, in that they wish to complement their classroom learning experience with elements of DE. The partnership model is best positioned to address this dichotomy.

Indeed, the logical evolutionary trend for this model, shown in Figure 2 (see p. 116), is for UAb to become a partner of all other universities through partnership agreements or protocols, according to which UAb provides a set of unique capabilities (experience and expertise in DHE, virtual pedagogical model, results of the DE Laboratory, etc.), and in return partner universities provide UAb with content that it can integrate into its own pedagogical offer. Some of these partnerships already exist. They were recently established through cooperation agreements, notably with the University of Évora, the University of Algarve and the University of Lisbon.

Despite representing a breakthrough in the institutional cooperation logic towards DE development, this model does not seem sustainable in the long term for four reasons.

First, the educational offer in Portugal is already highly dispersed, in a small and predictably decreasing market, especially considering the country's population pyramid[38].

Second, the partnership model is unlikely to be scalable enough to be profitable at a national level. The option of establishing bilateral partnerships involves the customization of each partnership according to the institutions involved. This approach has strong potential to result in several possible submodels, with obvious disadvantages in terms of nationwide replication capacity. Also, this option has a high degree of complexity in terms of definition and management of the partnerships portfolio, translated into effort and consequently comparatively high costs.

Third, in the long term this model blurs the distinctive factors of each partner, negating their own identity. In the case of UAb, the offer of programs with educational content made available by other HEI has the potential to become trivialized if not properly monitored by the entire DE structure, particularly by instructors and tutors.

FIGURE 2

Public DHE in Portugal – Partnership
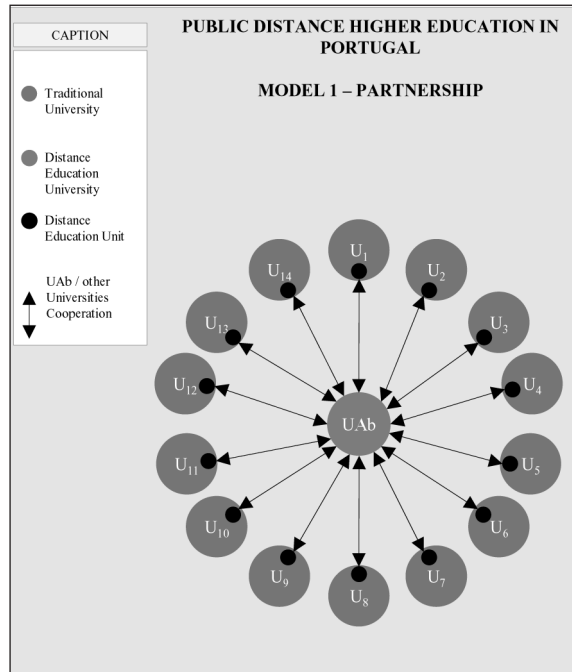
Source: Authors

Finally, this model has a fundamental shortcoming: from the "customer" point of view, there is no innovative approach to the "HE product". The overall experience (emotional and rational) of an education under these conditions is not differentiated because it only explores the combination of DE technological competence with classroom education content. In other words, it is a model where the whole is in essence equal to the sum of the parts and not greater, as it should be, for the learning experience to come across as effectively distinctive.
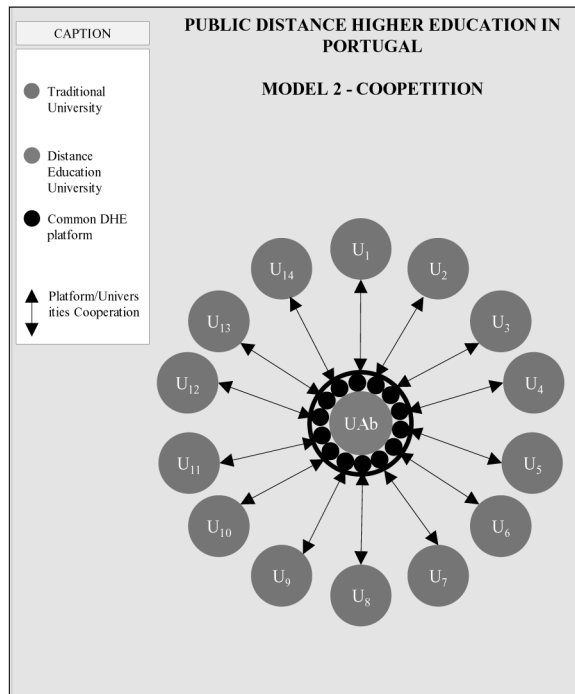
Coopetition

In view of the weaknesses of the partnership model, as well as the political, economic, social and technological environment, it is essential to design a model of inter-institutional cooperation within the framework of DHE that is able to circumvent the issues raised and be robust in the long term.

It becomes clear in this context that UAb should position itself as a vehicle for other universities where DHE is only part of the activity, and for which they do not

have clear competitive advantages. In this model, cost sharing is essential. If for no other reason, the country's situation (conjunctural and structural) advises thrift. The assumptions of the coopetition model, which is illustrated in Figure 3 and described in detail immediately afterwards, fit Portugal perfectly.

FIGURE 3

Public DHE in Portugal – Coopetition

CAPTION
● Traditional University
● Distance Education University
● Common DHE platform
▲▼ Platform/Universities Cooperation

PUBLIC DISTANCE HIGHER EDUCATION IN PORTUGAL

MODEL 2 - COOPETITION

Source: Authors

The central element of this model is the structured creation of a technological, procedural, methodological and even physical "space" that is common to all HEI and is exclusively dedicated to DHE. In this model, UAb takes a leading role in the management and organization of the common space, here denominated "common DHE platform", capitalizing on its position as the only undisputed HEI that specializes in DHE in Portugal.

The public service delivery model is thus based on the simultaneous combination of two antagonistic attitudes: competition and cooperation. HEI compete to attract students while they cooperate in building an advanced platform for common use and

benefit of all, which would not be possible (economically viable) to set up individually. In Portugal, this model has its most famous representative in the ATM network – "Multibanco" – in which virtually all retail banks participate, and which is managed by a specialized company, SIBS[39].

Moreover, the common DHE platform is the vehicle through which the strategic approach will evolve from offering a product to providing a service. This transition is made possible by the existence of new technologies, unavailable until recently. What is called for in this model is the adoption of an e-learning platform topped by a robust business intelligence[40] system. The latter will allow the development of the necessary data mining to design and continuously improve both the pedagogical offer (product) and the complementary offer (service[41]). Perhaps the most recognized example of the use of business intelligence as recommended here is Amazon, the world leader in the use of such a technology and methodology.

The common platform should be embodied in the following aspects:

Product / Service
- Pedagogical offer and complementary offer designed to fulfill the needs of students and alumni, based on behavioral information that is collected throughout the learning process;
- Full customization of the pedagogical offer, within the parameters allowed by A3ES[42], through flexible educational content, workloads, assessment models, etc., according to the students' preferences;
- Proactive student support, based on their profile, i.e., based on a thorough study of the results of the students and their behavior in the virtual campus. Provision of early and systematic support, conducive to a successful learning experience.
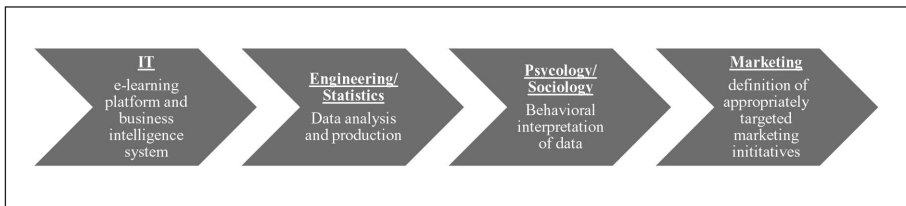
People
- Combination of skills to obtain synergies, through the creation of joint teams, originated in traditionally disconnected scientific areas;
- Organization of teams around the value chain of creation and maintenance of the product / service, as shown in Figure 4;
- Creation of joint teams that build and maintain both the pedagogical offer and the complementary offer, and serve the core team of instructors and tutors.

Processes
- Full range of new processes and methodologies, enabled by available technology (e.g., on-demand content, open education component);

- Modular construction of pedagogical offer and progressive scaling as internal capacity and demand evolve;
- Marketing based on the scalability of the students' database.

FIGURE 4
Value chain – Coopetition

IT	Engineering/ Statistics	Psycology/ Sociology	Marketing
e-learning platform and business intelligence system	Data analysis and production	Behavioral interpretation of data	definition of appropriately targeted marketing inititatives

Source: Authors

The main advantages associated with this model are:
- The feasibility of creating national scale, with all the ensuing savings and opportunities: 1) cost sharing and rationalization of efforts; 2) additional boost to a higher qualification of the population; 3) ability to focus the offer on areas of study that best serve the interests of the country in a concerted, planned and structured way; 4) access to a wider (common) student base, whose interaction with the platform will help feed the continuous improvement processes of the platform itself, justifying the existence of a centralized multidisciplinary team;
- The possibility of creating a revenue model that is adjusted to the commitment and contribution of each member of the platform (e.g., greater benefits or lower costs for members who represent a greater share of the common platform users)[43];
- The focus of each player on the areas where they have competitive advantages, thus contributing to a model where the whole is truly greater than the sum of the parts, because it incorporates synergies between them;
- The creation of a complete learning experience, not only from the rational point of view but also from the emotional perspective, based on solid knowledge on the needs of students. DHE would become perceived as a "sexy" approach to the transmission of knowledge, erasing its classical image of poor relation of HE.

There are also some risks in this model, which need to be managed appropriately:
- The solution cannot be universal and long-lasting in the exact manner in which it is conceived, i.e., it has to be evolved in order to serve a world in constant change, which will inevitably require adjustments in the future – it is suggested that a periodic review of the model should be incorporated from the outset;
- This is a demanding approach, which is not compliant with a low implementation rate. It will have to reach a minimum critical size for the results of statisti-

cal data mining to make sense and produce solid intelligence to support decision-making;

• The model will only work fully if an accreditation path is taken to ensure the quality of education provided, and therefore unequivocally repudiate the idea that the common platform could be a "diploma factory".

In conclusion, the development of DHE, relevant to Portugal's future, depends on a new vision by the key interveners in higher education (MCTES, CRUP and other stakeholders), and above all on their willingness to follow the coopetition route, which is the only one capable of delivering an enduring strategic solution within the framework of the country's fragility.

NOTES

1. This article is based on a subset of a much wider unpublished study, which was developed with the goal of supporting the reorientation of Universidade Aberta (UAb) and the re-foundation of distance higher education (DHE) in Portugal. The authors of this article were also the authors of that study; however, it is more than justifiable to show gratitude to the remaining members of the team, in particular to Pedro Camilo and Miguel Almeida. Finally, acknowledgements are also due to UAb, in particular to Professor Domingos Caeiro, who interacted actively and fruitfully with the team from ISCTE-IUL.

2. The European Commission defined lifelong learning as "all purposeful learning activity [formal and non-formal], undertaken on an ongoing basis with the aim of improving knowledge, skills and competence" (http://ec.europa.eu/education/lifelong-learning-policy/doc/policy/memo_en.pdf, 7/6/2010). It also states that its lifelong learning program enables people at all stages of their lives to take part in stimulating learning experiences, as well as helping to develop the education and training sector across Europe (http://ec.europa.eu/education/lifelong-learning-programme/doc78_en.htm, 7/10/2010).

3. Short term courses (between 60 and 90 ECTS), post-secondary, but not higher education, that provide professional qualification of level 5, on a scale of 1 to 8 (http://www.dges.mctes.pt/NR/rdonlyres/BA4CD986-0385-4DAC-BB19-EC8092BA3E6D/4077/cet6.pdf, 1/10/2010).

4. Perhaps not in Portugal, but certainly in countries such as the United Kingdom and the United States.

5. Combines classroom teaching techniques (e.g., lecturing, presentations and other classroom assignments) with DE practices (e.g., asynchronous discussions, blogs, chats and Internet use for assignments' submission).

6. In Portugal's specific case, despite all progress and as highlighted by UAb's dean in his appointment speech (3/5/2010), there is still a long way to go and much resistance to overcome until DE becomes "respected and supported as a field that is able to intervene positively in HE and the qualification of vast population groups", much as it happens in other developed countries.

7. http://ocw.mit.edu/index.htm, 3/10/2010. Another good example is the OpenCourseWare Consortium, a collaboration of more than 200 HEI (including the MIT, but none Portuguese) and associated organizations from around the world (more than 40 countries) that created a broad and deep body of open educational content, using a shared model.

8. Nowadays there is even an Open Access Week, an annual scholarly communication event focusing on open access and related topics, which originates from the National Day of Action for Open Access on February 15, 2007, organized across the United States. It takes place globally during the last full week of October in a multitude of locations both on- and offline. Some Portuguese HEI, including the UAb, have been associated with the event.

9. Diploma factories are characterized as having few or no classrooms at all, a doubtful faculty (in number and/or quality) and as hindering the learning process in unrelentingly seeking profit.

10. http://www.clubofrome.at/events/2006/brussels/files/lisbon-strategy-2000.pdf, 2/9/2010.

11. Ministry of Science, Technology and Higher Education.

12. http://www.portugal.gov.pt/pt/GC18/Documentos/Programa_GC18.pdf, 2/9/2010.

13. http://www.mctes.pt/archive/doc/cc_universidades.pdf, 23/3/2010.

14. http://www.pordata.pt/, 14/3/2011.

15. http://ec.europa.eu/eu2020/pdf/1_PT_ACT_part1_v1.pdf, 2/9/2010.

16. http://elpais.com/diario/2010/10/24/negocio/1287926066_850215.html, 31/10/2010.

17. http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home, 26.10.2010.

18. Idem.

19. http://www.ine.pt/xportal/xmain?xpgid=ine_main&xpid=INE, 4/9/2010.

20. Idem.

21. http://www.proinno-europe.eu/sites/default/files/docs_EIS2010/IUS_2010_final.pdf, 15/2/2011. The especial contribution comes from the new doctorate graduates, international scientific co-publications, and from the efforts made by the SMEs (innovating in-house, collaborating with others, introducing product or process innovations, introducing marketing or organizational innovations, and sales of new to market or new to firm innovations).

22. http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home, 26.10.2010. According to MCTES data, the breakdown of R&D investment changed significantly over the last 25 years: the share of corporations increased from about 30% to approximately 50%, while the state's (including via HE) decreased from 65% to nearly 40%. The remainder is accounted for by private not-for-profit institutions.

23. http://www.ine.pt/xportal/xmain?xpgid=ine_main&xpid=INE, 4/9/2010.

24. http://www.dges.mctes.pt/DGES/pt/Estudantes/Rede/Ensino%20Superior/Estabelecimentos/Rede%20P%C3%-BAblica/, 8/9/2010.

25. The legal framework of higher education institutions, of 2007.

26. This phenomenon is widely covered and deeply analyzed, for example, by Morphew (2000).

27. http://jn.sapo.pt/PaginaInicial/Nacional/Interior.aspx?content_id=1649811, 2/9/2010.

28. http://www.ine.pt/xportal/xmain?xpgid=ine_main&xpid=INE, 5/12/2010.

29. The Local Learning Centers are small facilities where formal, non-formal and informal education initiatives are held with a view to developing academic, professional, cultural and civic skills in various areas (technical, artistic, cultural, scientific or economic). They were created through cooperation protocols between UAb and local councils. The latter are to provide basic equipment, facilities and maintenance. Part of UAb's role is to pay for examination expenses and the coordinator's remuneration.

30. http://www.UAb.pt/web/guest/estudar-na-UAb/oferta-pedagogica/1ciclo, 3/9/2010.

31. http://www.UAb.pt/web/guest/estudar-na-UAb/oferta-pedagogica/2ciclo, 3/9/2010.

32. http://www.UAb.pt/web/guest/estudar-na-UAb/oferta-pedagogica/3ciclo, 3/9/2010.

33. http://www.dges.mctes.pt/NR/rdonlyres/31992B83-D329-4D4D-B29E-7AF86BFACA6E/1248/DSSRedeListagemdeCursos deELearningCompleta.xls, 22/3/2010.

34. Coordinating Council of Polytechnic Institutes. http://jn.sapo.pt/PaginaInicial/Nacional/Interior.aspx?content_id=1649811, 2/9/2010.

35. As brands become more similar, people make their choices increasingly on the basis of price. In overcrowded industries, (real) differentiation becomes harder not only during crises, but also at normal times.

36. We only need to remind ourselves of the majority of the companies that were considered successful in books such as **In Search of Excellence** and **Built to Last**, ten years after those bestsellers were published (1982 e 1994, respectively). What has become of those who imitated (and envied) such success cases, and applied the same "recipes" to their own situation?

37. Coopetition is a term that was coined to describe cooperative competition. Coopetition normally occurs when organizations establish partnerships in some of their activities, where they believe they do not hold any competitive advantage and therefore there are able to share costs while maintaining aggressive competitiveness in other areas. One example is the agreement between PSA Peugeot Citroën and Toyota to share components for a new compact, which materialized in components for the following models: Peugeot 107, Citroën C1 and Toyota Aygo.

38. In the 2010/11 national contest for access to higher education, a total of 105 programs offered 2639 places. They admitted only 267 candidates, resulting in less than 6 students per program in all cases (almost 20 programs did not admit one single student in the first phase of the contest).

39. It should be noted that Multibanco is nowadays recognized as perhaps the most sophisticated interbank network in the world, having been awarded many prizes. Two elements have certainly contributed to its success: 1) the fact that when Multibanco was created in 1985, the banking system was owned by the State and therefore there was

a common shareholder to all participants; and 2) the fact that the technology it used was the most advanced at the time, benefiting from other international experiences that were already underway. The model that is presented here for the common DHE platform shares those same elements.

40. Business intelligence is understood here as the process of extracting, transforming, loading and analyzing great volumes of data on past activities, with a view to predicting the characteristics of future activities and it is widely used in the corporate world.

41. The complementary offer may include services such as student or alumni career counseling (interview preparation, and CV writing support, for example) and soft skills modules such as negotiation, persuasion, leadership, motivation, etc.

42. Agency for Assessment and Accreditation of Higher Education.

43. The specific details of the model will have to be negotiated between the various participants and are beyond the scope of this article.

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APPENDICES

TABLE I
Population with HD degrees

Category	2000	2009
Resident, above 15 years old	6.5%	11.2%
Employed	9.4%	15.8%
Active	9.3%	15.3%
Unemployed	7.4%	10.4%

Memorandum item: Unemployment rate for people with a degree from a HE 3.1% 6.4%
Source: INE

TABLE II

Unemployed population and graduates, by area of study (resident in the mainland)

Area of Study	Unemployed Graduates: 1999 - 2009		Total Graduates: 1998/99 - 2007/08		Unemployed/ Graduates (%)
	No. (A)	Weight	No. (B)	Weight	(A) / (B)
Security Services	66	0.2%	2,900	0.4%	2.3%
Mathematics and Statistics	175	0.5%	7,065	1.1%	2.5%
Education	2,621	7.9%	98,512	15.2%	2.7%
Health	2,717	8.2%	94,732	14.6%	2.9%
Computer Science	373	1.1%	10,536	1.6%	3.5%
Transportation Services	24	0.1%	607	0.1%	4.0%
Engineering and equivalent	2,522	7.6%	57,760	8.9%	4.4%
Law	1,140	3.4%	24,645	3.8%	4.6%
Physical Education	553	1.7%	11,512	1.8%	4.8%
Agriculture, Silviculture and Fishery	535	1.6%	11,226	1.7%	4.8%
Humanities	1,373	4.1%	26,160	4.0%	5.2%
Life Sciences	615	1.9%	11,345	1.7%	5.4%
Business Studies	5,795	17.5%	105,194	16.2%	5.5%
Veterinary Science	138	0.4%	2,314	0.4%	6.0%
Personal Services	1,350	4.1%	22,017	3.4%	6.1%
Architecture and Construction	2,175	6.6%	33,085	5.1%	6.6%
Art	2,260	6.8%	30,246	4.7%	7.5%
Environmental Protection	681	2.1%	8,642	1.3%	7.9%
Social and Behavioral Studies	4,212	12.7%	51,867	8.0%	8.1%
Manufacturing	713	2.2%	8,378	1.3%	8.5%
Journalism and Information Science	1,383	4.2%	14,175	2.2%	9.8%
Social Services	1,713	5.2%	16,025	2.5%	10.7%
TOTAL	**33,134**	**100.0%**	**648,943**	**100,0%**	**5,1%**

Source: IEFP, MCTES

TABLE III
Students enrolled in HEI, by subsystem

Subsystem	2000/01	2001-02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
Higher Public Education	**273,530**	**284,789**	**290,532**	**288,309**	**282,273**	**275,521**	**275,321**	**284,333**
Universities	171,735	176,303	178,000	176,827	173,897	171,575	169,449	175,998
Polytechnics	101,795	108,486	112,532	111,482	108,376	103,946	105,872	108,335
Higher Private Education	**114,173**	**111,812**	**110,299**	**106,754**	**98,664**	**91,791**	**91,408**	**92,584**
Universities	82,979	79,908	77,109	73,708	67,157	61,740	60,659	61,221
Polytechnics	31,194	31,904	33,190	33,046	31,507	30,051	30,749	31,363
Universities Total	**254,714**	**256,211**	**255,109**	**250,535**	**241,054**	**233,315**	**230,108**	**237,219**
Polytechnics Total	**132,989**	**140,390**	**145,722**	**144,528**	**139,883**	**133,997**	**136,621**	**139,698**
Higher Education Total	**387,703**	**396,601**	**400,831**	**395,063**	**380,937**	**367,312**	**366,729**	**376,917**

Source: MCTES

TABLE IV
Students enrolled in HEI, (1st year, 1st time) by subsystem

Subsystem	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Higher Public Education	**65,929**	**65, 921**	**67, 640**	**64, 801**	**63, 365**	**63, 691**	**70, 151**	**84,279**	**87, 988**
Universities	39,229	39, 235	41, 971	41, 238	40, 880	42, 559	44, 780	52, 818	54, 243
Polytechnics	26,700	26, 686	25, 669	23, 563	22, 485	21, 132	25, 371	31, 461	33, 745
Higher Private Education	**27,320**	**26, 915**	**26, 806**	**24, 468**	**20, 998**	**19, 029**	**25, 190**	**29, 835**	**27, 384**
Universities	16,942	16, 333	16, 137	14,528	12, 545	11, 608	16, 428	20, 171	18, 956
Polytechnics	10,378	10, 582	10, 669	9, 940	8, 453	7, 421	8, 762	9, 664	8, 428
Universities Total	**56,171**	**55, 568**	**58, 108**	**55, 766**	**53, 425**	**54, 167**	**61, 208**	**72, 989**	**73, 199**
Polytechnics Total	**37, 078**	**37, 268**	**36, 338**	**33, 503**	**30, 938**	**28, 553**	**34, 133**	**41,125**	**42, 173**
Higher Education Total	**93, 249**	**92, 836**	**94, 446**	**89, 269**	**84, 363**	**82, 720**	**95, 341**	**114 ,114**	**115,372**

Source: MCTES

TABLE V
Students enrolled in HEI, (1st year, 1st time) by area of study

Area of Study	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Education	16,004	14,606	13,322	11,056	8,293	7,160	5,864	6,816	7,143
Arts and Humanities	8,584	8,266	8,579	8,332	7,796	8,246	9,389	11,880	11,326
Social Science, Commerce and Law	27,313	26,950	28,564	26,859	26,243	25,553	33,074	38,606	39,987
Science, Mathematics and Computer Science	7,557	7,058	7,159	6,760	6,323	6,357	7,601	9,466	9,431
Engineering, Manufacturing, and Construction	15,192	14,402	15,037	14,820	14,057	12,734	15,181	19,930	20,719
Agriculture	1,714	1,354	1,189	1,011	1,069	1,024	1,316	1,968	1,855
Health and Social Protection	11,924	14,959	15,243	15,419	15,937	16,899	17,061	18,297	16,893
Services	4,961	5,241	5,353	5,012	4,645	4,747	5,855	7,151	8,018
Total	**93,249**	**92,836**	**94, 446**	**89,269**	**84,363**	**82,720**	**95,341**	**114,114**	**115,372**

Source: MCTES