

# Portugal

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## National context

### Population, economic and social characteristics

The educational system is divided into preschool (for those under age 6), basic education (9 years, in three stages, compulsory), secondary education (3 years, until 12th grade), and higher education (university and polytechnic).

The total adult literacy rate is 99 percent. Portuguese primary school enrolments are close to 100 percent. According to the OECD's Programme for International Student Assessment (PISA) 2009, the average Portuguese 15-year-old student, when rated in terms of reading literacy, mathematics and science knowledge, is placed at the same level as those students from the United States, Sweden, Germany, Ireland, France, Denmark, United Kingdom, Hungary and Taipei, with 489 points (493 is the average). Over 35% of college-age citizens (20 years old) attend one of the country's higher education institutions (compared with 50% in the United States and 35% in the OECD countries). In addition to being a destination for international students, Portugal is also among the top places of origin for international students. All higher education students, both domestic and international, totalled 380,937 in 2005.

Portuguese universities have existed since 1290. The oldest Portuguese university was first established in Lisbon before moving to Coimbra. Historically, within the scope of the Portuguese Empire, the Portuguese founded in 1792 the oldest engineering school of Latin America (the Real Academia de Artilharia, Fortificação e Desenho), as well as the oldest medical college in Asia (the Escola Médico-Cirúrgica de Goa) in 1842. The largest university in Portugal is the University of Porto. Universities are usually organized into faculties.

Institutes and schools are also common designations for autonomous subdivisions of Portuguese higher education institutions. The Bologna process has been adopted since 2006 by Portuguese universities and poly-technical institutes. Higher education in state-run educational establishments is provided on a competitive basis, a system of numerus clausus is enforced through a national database on student admissions. However, every higher education institution offers also a number of additional vacant places through other extraordinary admission processes for sportsmen, mature applicants (over 23 years old), international students, foreign students from the Lusosphere, degree owners from other institutions, students from other institutions (academic transfer), former students

(readmission), and course change, which are subject to specific standards and regulations set by each institution or course department. Most student costs are supported with public money. However, with the increasing tuition fees a student has to pay to attend a Portuguese state-run higher education institution and the attraction of new types of students (many as part-time students or in evening classes) like employees, businessmen, parents, and pensioners, many departments make a substantial profit from every additional student enrolled in courses, with benefits for the college or university's gross tuition revenue and without loss of educational quality (teacher per student, computer per student, classroom size per student, etc.).

### **Description of the types of education and training (formal and informal) that occur in a country**

In Portugal, the Ministry of Education and Science, has the responsibility for defining, coordinating, implementing and evaluating national policies for education, science and information society, articulating them with the policies of qualification and training. The Ministry performs this responsibilities via direct administration services of the State (central and peripheral services), indirect administration, advisory bodies and other entities. In the Autonomous Regions of the Azores and Madeira, the Regional Governments, via the respective Regional Secretariats for Education, are responsible for defining the national education policy to a regional plan and manage human, material and financial resources.

Pre-primary education is the first stage of the Portuguese education system and is aimed at children aged between 3 to 5 years old. In 2009, the universality of pre-primary education for all children over 5 years old was established, but attendance is not compulsory. The preschool network is provided by the state, private and cooperative bodies, and private social solidarity institutions and by non-profit institutions.

Compulsory education begins at the age of 6 and lasts for 12 years. It encompasses Basic Education and Secondary Education. Basic Education lasts for 9 years and is divided into three cycles: the first cycle corresponds to the first four years of schooling; the second cycle corresponds to the next two years (these two cycles together correspond to primary education); and, the third cycle that lasts for three years and corresponds to Lower Secondary Education. The articulation of the three cycles is sequential and each cycle should complete and deepen the previous one, within a global perspective. Specific goals within each cycle are integrated into the overall objectives of basic education, according to their age and stage of development. Secondary Education lasts for three years and corresponds to Upper Secondary Education. It can be organized in different paths, comprising courses aiming the preparation for working life or further studies. The permeability between courses oriented to working life and courses geared to continue studies is guaranteed. Compulsory education is provided in public schools, private and cooperative schools. State-run schools are free of charge.

Higher Education is structured according to the Bologna principles to ensure a solid scientific and cultural preparation plus technical training that qualifies students for professional and cultural life while developing their capability to innovate and make critical analysis. Higher Education includes university and polytechnic education. University and polytechnic education is offered by public, private and cooperative institutions.

## **Practices and organisations**

In Portugal, qualified teachers have to have a Postgraduate Certificate of Education. The qualification is obtained after having attended and passed initial teacher training courses which are offered at Higher Education institutes and at universities and which are structured in conformity with teacher-education profiles. Such courses lead to a professional qualification at the level of a Master's degree according to terms laid down in the law governing vocational training for teachers in pre-primary schools and in compulsory and secondary education.

With regard to the main policies and measures for developing the on-going training of teachers, the Ministry of Education has clearly wagered its strategic target on consolidating Portuguese teachers' competences and skills in Management and Leadership, mainly in terms of teachers' leadership positions. The vital role played by professional training programmes that are specifically aimed at satisfying the needs of the Portuguese educational system, has been fully acknowledged. Acting upon the clear, firmly-entrenched notion to up-grade educational human resources, the Ministry of Education has implemented several programmes by going through its Directorate General of Human Resources in Education in partnerships with different actors. These programmes are geared at school leadership training and target the Directors of schools or Groups of school as described further on (in A – 9.3.1.). Also worth mentioning is the Technological Education Plan (TEP) which, in 2010, was funded by the Human Potential Operation Programme (HPOP) falling within the National Strategic Reference Framework and covered by the State Budget. The TEP 2010 Training Programme was globally applied to all public education establishments that did not cater to Higher Education and involved 90% kindergarten teachers and teachers in compulsory and secondary education. Its aim was to train about 130,000 teachers over a 60-hour course spread over a 4-year period: the teachers taking the course had to obtain a pass in 4 short-term courses of 15 hours each covering 4 nuclear subjects on the didactics of using Information and Communication Technology in the classroom.

### **Professional Development of Teachers, Trainers and School Leaders**

Currently in Portugal, an action plan is being drawn up in order to guarantee the quality, attractiveness and relevance to the job market of education and vocational training via partnership with enterprises and other bodies.

This plan includes a revision of the initial teacher training model for primary and secondary education in order to improve quality, as well as redefining the system of access to the teaching profession.

In parallel with this revision, Portugal has been consolidating pedagogical and organisational autonomy of schools. This is particularly important in terms of curricular development. These schools implement the curriculum and complete it, taking into account the established general principles. Its application should be tailored to the characteristics of both students and schools. Education should accept and create the right conditions for all students, both to remedy learning difficulties and to develop student capacities. The aim is for every school to value the experiences and collaborative practices that lead to improved teaching. To this end, Portugal aims to implement the principles enshrined in the regime of autonomy, coordinating it with curriculum development, providing greater flexibility in terms of organising teaching

activities, increasing efficiency in how they are distributed and improving academic outcomes, particularly via the following measures:

- Conceding hour credits, according to factors such as the efficient management of resources and the number of classes, while considering the academic progress and outcomes achieved;
- Being flexible regarding the duration of classes according to each school's individual criteria, with classes no longer having to last 45 minutes (or multiples of 45 minutes);
- Establishing a minimum time for each subject and a total maximum workload, giving schools the autonomy to distribute lessons so as to facilitate patterns or solutions that allow schools to achieve pre-established objectives in certain subjects;
- Making it possible to offer complementary cultural curricula with a flexible workload, to be used with school credit, specifically with Civics, Health Education, Financial Education, Media Education, Road Education, Consumer Education, Entrepreneurship Education and others.

## **Policy environment**

### **Digital Portugal Agenda**

On 20th December, 2012, the new national Digital Agenda (Digital Portugal) was approved by the Council of Ministers. This aims to contribute to the development of the digital economy and the knowledge society, thus preparing the country for a new economic model focused on innovation and knowledge and a new industrial policy that serves as a basis for providing new products and services with greater added value and ones more geared towards international markets.

The Digital Portugal Agenda foresees major involvement from the private sector, particularly in the field of information technology and communication (ICT). This specifically involves six areas:

- i) Access to broadband and the digital market;
- ii) Investment in research and development (R&D) and innovation;
- iii) Improving digital literacy, qualifications and inclusion;
- iv) Combating fraud and tax, contributory and payment evasion;
- v) Dealing with challenges in society;
- vi) Entrepreneurship and internationalisation of the ICT sector.

Due to the importance of certain projects in the fields of science and education, the following intervention areas are highlighted:

### **Investment in Research and Development (R&D) and Innovation**

#### Consolidating research and innovation capacity in ICT

Consolidating research and innovation capacity in ICT in cooperation with the scientific system and businesses in a highly competitive environment of internationalization. Supporting and encouraging research and innovation in emerging areas, such as green technologies for an efficient use of ICT for more sustainable development, as well as

promoting applied research, via cooperation between research centres and companies in the ICT sector.

#### E-Science and Internet of the future

Encouraging the development of tools that support the activities of the scientific community and innovation, such as the national platforms provided by the science, technology and society network (STSN) with distributed services for research and higher education, which involve major economies of scale. Supporting distance collaborative work, via supercomputing, GRID computing (INGRID - National Grid Initiative), voluntary scientific computing (IBERCIVIS), access to scientific digital libraries and free access repositories, R&D project results, as well as other academic and data publications. Promoting R&D in the area of cloud computing.

#### Encouraging the development and provision of advanced services

Promoting the development of production and provision of applications with content and services that add economic value, taking advantage of the potential of next generation networks (NGN), particularly applications that involve both video and interactivity, such as e-Learning, e-Public-Services, e-Health, e-Education, ICT applications that monitor and measure environmental challenges (new generation of Internet-based services and applications) and the increase of online services in non-higher education, encouraging greater use and development of NGN.

#### **“Internet of Things”**

Promoting R&D on the "Internet of Things", as well as a national industry of "Things connected to the Internet", while promoting the creation of public infrastructure for things connected to the Internet in different areas, such as "Smart Cities", "Smart Transport", "Smart Energy Networks" and "Smart Health Care." The interconnection with private Portuguese business infrastructure will also be promoted, stimulating a market for the Internet of interoperable things on a European level.

#### **Dealing with challenges in society: Improving Education**

##### Consolidating the unified education network

Integrating MEC and STSN schools' data network in order to establish a communications platform for common data via: the extension of the STS network to yet to be connected MEC bodies, benefiting from high-speed links of the STSN, both for national operators and for Europe and the rest of the world via the GÉANT European network, from contracting services for the access network of schools to be included in the external connectivity of the STS network. Developing a unified voice network for the MEC, interconnecting the data network, converging fixed-line and mobile communications and interconnecting with other public administration voice network systems

##### The Education Cloud

Supporting the creation of a shared services platform for MEC schools and bodies, using cloud computing technologies, in order to provide the centralised availability of infrastructure

components, standard platforms and systems, as well as specific MEC applications which facilitate the introduction of transversal systems and procedures for the collection, processing and availability of information. Promoting desktop virtualisation, both in MEC bodies and in schools, in order to reduce the costs of replacing equipment and licensing, as well as the on-going and sustained adoption of open-source software in MEC schools and bodies, both at work-station and server level.

## **Improving digital literacy, qualifications and inclusion**

### Developing competencies for the digital economy

Promoting the use of ICT in education and training. Developing advanced skills and talent for the digital economy, particularly at top level and with the appropriate expertise for the needs of global competitiveness. Adapting digital competencies to emerging areas, such as green technologies, smart grids, cloud computing, Internet security and cultural and creative industries. Promoting the development of multidisciplinary competencies, using ICT in a transversal fashion within the different scientific areas. Fostering partnerships between ICT companies and business associations, in order to promote the introduction of ICT in the business community, increasing business capacity and capacity-building in the business community and the community of workers in SMCs. One of the projects within this sphere will be the Digital Academy, which aims to give trainees practical and advanced skills in the digital management of business, including e-commerce, digital marketing, product development and digital services, digital property and law, technology and entrepreneurship.

### Promoting digital inclusion and regular use of the Internet

Promoting the use of ICT for social inclusion (ICT and Society), in order to allow greater penetration of technologies and the digital economy within the population and consolidate digital citizenship, as well as for citizens in remote areas, with low levels of education, the elderly or those with special needs, from a lifelong learning perspective.

### Promoting the widespread creation and digitalisation of content

Encouraging the creation and development of content in Portuguese language. Interoperable technical formats will be adopted in accordance with open standards to make digital content openly available, in order to ensure the necessary quality of content to be digitalised.

### Promoting the availability and use of e-Books

Promoting policies for the lending of school and technical e-Books; something which is already happening in some countries. This lending policy will lead to cost reductions for readers, promoting the adaptation of works to groups with special needs and, in addition, will discourage the violation of copyright, due to the limited expenditure involved.

Defining a policy of accessibility to Portuguese digital platforms and content on the Internet Encouraging legislative measures on the adoption of accessibility guidelines applied to the web that foster universal access to available content and platforms, involving the following key sectors: central and local administration, educational institutions, online banking, utilities, media (television, radio, newspapers), e-commerce (large commercial chains, including hotels).

## **Entrepreneurship and the Internationalisation of ICT**

### Consolidating the internationalisation of ICT

Promoting improvements to aspects of international trade with third-party countries and the governance (involving different players) of the open Internet, as well as consolidating international cooperation in R&D and innovation, particularly with African Countries of Portuguese Official Language (Países Africanos de Língua Oficial Portuguesa – PALOP) for the dissemination of Portuguese language on the Internet. Some of the goals of this initiative include the internationalising of ICT businesses, encouraging excellence in Portuguese science abroad and using researchers abroad as internationalisation platforms for Portuguese products. The aim is also to encourage the development of consortia and complementary business clusters in the areas of services, solutions and products that have great potential for internationalisation (e-Gov, education, health, mobility, etc.).

Considering the abovementioned objective, a cooperation protocol was signed between the Ministry of Economy and Employment (Ministério da Economia e Emprego – MEE), of Ministry of Foreign Affairs (Ministério dos Negócios Estrangeiros – MNE) and MEC and E-Example - Complementary Business Cluster of the teaching, learning and training technologies industry - for cooperation in the field of entrepreneurship, innovation, industrial development and internationalisation in the sector, in order to maximise the benefits of information and communication technologies (ICT) and electronics and the digital economy in Portugal. This encourages the development and the use of the digital economy by citizens, businesses and the state, stimulating the creation of products, services and competitive technological solutions that are geared towards international markets.

### **Enhancing Creativity and Innovation, Including Entrepreneurship, at all Levels of Education and Training**

Partnership with Business, Research, Civil Society  
Impulso Jovem

Strategic Plan, which is based on three key areas:

- Professional internships;
- Support for recruitment and entrepreneurship;
- Support for investment.

Professional internships aim to ensure that the most qualified young people internalize skills within places of employment by providing them with professional integration or reintegration, as well as participation in vocational training. They are provided in a range of areas, such as social economy, agriculture, youth and sports associations, as well as companies with investment projects in the areas of innovation, industrialization and internationalization.

The employment passport gives priority to applications from companies that operate in the tradable goods and services sectors, so as to increase export capacity and contribute to the balance of trade. Integration contributes to job creation after the internship, when recruitment occurs via a non-fixed-term contract.

Recruitment support, via a social security contribution refund, aims to reduce the costs associated with hiring young people who have been unemployed for over 12 months, in return for a full-time employment contract. Entrepreneurship support aims to support the implementation of business ideas by young people, providing a possible alternative to working for others.

By using some existing tools and creating others, investment support aims to support Small and Medium-sized Companies - SMC, regarding expansion and the creation of youth employment. The «Impulso Jovem» Strategic Plan operates on both sides of the employment market and creates the right conditions for companies to generate skilled and lasting jobs, overcoming current financing constraints, while adjusting their production pattern to the new sustainable economic paradigm desired.

This Plan aims to create job opportunities for young Portuguese people, providing certified training or on the job training, always with the purpose of a lasting work relationship later in order to reverse the trend of rising structural unemployment amongst young people. Within this context, the implementation of mechanisms and measures that encourage recruitment and young entrepreneurship is essential, facilitating access to finance for small and medium-sized companies, supporting their innovation and internationalization. The funding for the «Impulso Jovem» Plan adheres to the strategic focus defined by the reprogramming the National Strategic Reference Framework (Quadro de Referência Estratégica Nacional - QREN), ensuring that a part of the support provided is geared towards the convergence regions (North, Centre and Alentejo), thereby contributing to the reduction of regional imbalances and social and national cohesion in the country.

#### Short-Term Training Units

The National Qualifications Catalogue (Catálogo Nacional de qualificações - CNQ) will be able to include Short-Term Training Units (Unidades de Formação de Curta Duração - UFCD) of 10 hours as part of a pilot project. This will enable it to respond to a recurring request from employers and sitting members of the Standing Committee for Social Dialogue, to create individual and more flexible qualification pathways, adjusted to the development of skills considered critical for the competitiveness and modernization of the Portuguese economy. Later, an assessment of this pilot project will be carried out by the National Agency for Qualification and Vocational Education (Agência Nacional para a Qualificação e o Ensino Profissional - ANQEP), the managing body for the CNQ, with a view to introducing any adjustments necessary and possibly extend this measure to other areas of education and training within the CNQ. All of these UFCD are independently accredited and count towards the completion of the qualification pathways leading to a qualification from the National Qualifications Framework.

#### Youth Scientists and Researchers

MEC established a partnership with the Youth Foundation (Fundação da Juventude) in view of the contest “Youth Scientists and Researchers”. This contest has a European scope and is developed in Portugal since 1992. It aims to promote the ideals of cooperation and interchange among scientists and researchers, as well as to foster the emergence of young talents in areas such science, technology, research and innovation. In Portugal pupils enrolled in basic and secondary education, as well as in the first year of higher education can participate in the contest. Program for Young Students in Higher Education in Business



(Programa de Estágios de Jovens Estudantes do Ensino Superior nas Empresas – PEJENE)  
The Internship Program PEJENE aims to create a direct relationship between Universities and Enterprises (Accessed 4 March 2013). This nationwide program internship, which begun in 1993 and is now in its 20th edition, allows young students to access a recognized professional experience, facilitating their subsequent entry into the labor market. The PEJENE is sponsored by the Youth Foundation (Fundação da Juventude), with the special participation of the Portuguese Youth Institute (Instituto Português da Juventude - IPJ) and the co-promotion of Institute of Employment and Professional Training (Instituto de Emprego e Formação Profissional - IEFP), Institute of Support to Small and Medium Enterprises and Innovation (Instituto de Apoio às Pequenas e Médias Empresas e ao Investimento - IAPMEI) and Insurance Tranquility (Companhia de Seguros Tranquilidade). The PEJENE is addressed to Higher Education students enrolled in public, private and/or cooperative schools, on the final years of the degrees of Licenciatura (1st Cycle), Mestrado (2nd Cycle), Mestrado integrado programme (integrated master programme), and covers all the study areas. The internships (unpaid) are held annually for a period of 2 or 3 months, take place during summer interruption of the academic activities, which coincides with the extra needs of employers in terms of human resources in the enterprises.

#### FCT Researcher Programme (Programa investigador FCT)

The "FCT Researcher Programme", regulated by Decree-Law no. 28/2013, 19th February, focusses on research in host institutions in Portugal by the youngest and most competitive PhD holders. Enjoying full autonomy in how their research is conducted, it allows the researcher, from the outset, direct involvement in the National Scientific and Technological System (Sistema Científico Tecnológico Nacional - SCTN), fostering mobility and strengthening host institutions, enabling them to attract this type of researcher without investing their own resources. This programme aims to keep the best researchers currently in Portugal and attract others from abroad who wish to contribute in this way, as well as providing researchers with the right conditions to develop professionally and the necessary stability and financial planning of their scientific endeavour. The "FCT Researcher Programme" is one of the Foundation for Science and Technology (Fundação para a Ciência e a Tecnologia, I.P. – FCT) support mechanisms for the SCTN.

#### Strategic Programme of International Partnerships in Science, Technology and Higher Education

In terms of partnerships developed in Portugal, we must refer that by the end of 2006, and for a 5 year period ending in 2011, the Portuguese Government signed 3 agreements, to create a strategic programme of international partnerships in science, technology and higher education - due to its success these programmes are still valid and going on. By September 2007 the first doctoral and advanced studies programmes were officially launched, bringing together several Portuguese universities and leading universities worldwide, including the Massachusetts Institute of Technology (MIT), Carnegie Mellon University (CMU) and the University of Texas at Austin (UT Austin). These programmes facilitated the creation in 2007 of effective thematic networks involving a large number of Portuguese institutions with the objective of stimulating their internationalisation through advanced studies projects and sustainable schemes to stimulate new knowledge and exploit new ideas in collaboration with companies and internationally renowned institutions, as follows:

The MIT Portugal Programme offers PhD, Master's and Advanced Studies programs. MIT Portugal's doctoral programmes are awarded jointly by the participating Portuguese

institutions in each area, and take three to four years to complete. MIT collaboration in supervision and teaching is a strong feature of these programmes, as are reciprocal student visits to MIT for some students who have been awarded FCT-MIT Portugal PhD grants. The Master's programme (Bologna 2nd cycle) brings together the tradition and integrity of an MSc with the insights of an MBA. Curriculum development, teaching and supervision are organized jointly by the Portuguese participating universities and MIT. Executive Master's (Bologna 3rd cycle) are one-year professional programmes that are awarded by the participating Portuguese institutions in each area along with reciprocal student visits. The programmes are oriented to people already pursuing professional careers in relevant fields. Through the joint programme with MIT, co-operation with the Sloan Management School was strengthened through an international MBA programme, "Lisbon MBA". This involves co-funding from seven major Portuguese companies and banks in a way that will stimulate new research and the quality of education in management sciences in Portugal. The Carnegie Mellon-Portugal Programme supports faculty exchange programmes, in which academics from Portuguese universities can spend at least one term working in research and education at Carnegie Mellon to experience the culture of a top United States university. Carnegie Mellon professors are also given the opportunity to spend time in Portugal to engage in teaching and research activities with local HEI and research labs. The Programme involves post-Doctoral training, dual professional Masters and PhD programmes by Portuguese institutions and Carnegie Mellon University. Through various funding sources a range of scholarships, fellowships, and stipends are offered on a competitive basis, to qualified students as a way to help recruit top students. These are open to all applicants. For masters' students, fellowships to cover partial tuition costs may be available to qualified students in the Information and Communication Technologies Institute's - ICTI, program. These students may also benefit of additional living stipends in addition to the tuition offsets. For doctoral students, some tuition offsets are also available, and many programs also offer modest living stipends.

Under the University of Texas in Austin-Portugal programme, "Collaboratorating for Emerging Technologies, CoLab" was launched, in March 2007. The programme offers a variety of educational opportunities for Portuguese students and industry professionals ranging from lectures and workshops to a dual doctoral program and post-doctoral fellowships. The main objective of this collaboration was, and continues to be, to strengthen Portuguese scholarly research, graduate-level education, industrial links, and academic entrepreneurship. From the start, this collaboration focused on building strong and mutually beneficial scholarly relationships among Portuguese and UT Austin faculty and students in three academic areas: Digital Media, Advanced Computing, and Mathematics. Emphasis was focused on establishing collaborative research, faculty and student exchange, and capacity building through conferences, workshops, and academically-related events.

By the same time, was signed a Memorandum of Understanding with the Fraunhofer Gesellschaft Institute for the establishment, in Portugal, of the first Fraunhofer Institute in Europe outside Germany through the recently established Fraunhofer Portugal Research Association. In 2009, the Portuguese Government decided to include another American university, in the area of health, by signing an agreement with the Harvard Medical School. Therefore, the Harvard-Portugal Programme was created, a research program directed at strengthening the national capacity to produce new translational and clinical knowledge with impact on specialized medical education and the practice of clinical medicine. It will be developed in close cooperation with teams from Harvard Medical School and will encompass networks to be formed between Portuguese schools of medicine and medical sciences and

major national laboratories and research centers working in translational and clinical research. Participants in the research grants will include Portuguese and Harvard principal investigators, research fellows, clinical fellows, medical and graduate students, and undergraduate students. The program will include joint Harvard-Portugal workshops, retreats, and symposia. The programme also implies the launching and streamlining of post-graduate medical training, including Junior and Senior Clinical Research and Career Development Awards for Portuguese MD trainees.

The lines of action will be launched on an entirely competitive basis at the national level, respectively for i) the identification and selection of research projects and networks; ii) the selection of MD trainees for post-graduate programs; iii) the respective training offered at the national level; and iv) the systematic review and production of educational material by specialist teams in Portuguese medical schools. The International Iberian Nanotechnology Laboratory (Laboratório Ibérico Internacional de Nanotecnologia - INL), implemented in the Portuguese city Braga, was created through an international treaty between Portugal and Spain, which was signed at the end of 2006. The INL is the first research laboratory set up under international law in the Iberian Peninsula and is also the first institution worldwide explicitly focused in nanotechnology. It is expected to achieve a reputation as an international institution of excellence in application areas of food and water quality, environmental monitoring and nano-medicine. This Laboratory was conceived to host about 200 researchers from all over the world, and a total of 400 people, based on an annual investment and operational budget of around 30 million Euros funded equally by both participating countries. The developments of this Laboratory will also imply strong links with industry and is intended to attract the membership of more European countries and countries of other continents.

It should be referred that Portuguese higher education institutions (HEI) also have established partnerships with other HEI or research centres, many of which may imply mobility of students, researchers and academic staff.

### Entrepreneurship

The modernisation of higher education in the last years has been increasingly based on social responsibility, in order to support the active participation of students in society, while simultaneously developing their academic activity. Portugal has aimed at reinforcing the conditions for students to be able to develop part-time professional activities in the institutions where they are studying, as well as helping them to enter the labour market. In order to understand the employment and professional paths for graduates in recent years a clear framework that collects and distributes information to HEI has been developed. In collaboration with the Portuguese Institute for Employment and Professional Training (Instituto do Emprego e Formação Profissional - IEFP) a report has started to be issued each semester with information regarding those that are enrolled in the employment offices that have a higher education degree, to help students and their families make more informed choices. In order to prepare for the future and to create ties between employers and HEI, it is necessary to stimulate in Portugal intergenerational trust that will promote the qualification of the population as well as social and economic development. This should be done in order to make way for the future that our youth represents, and secure the relevance of knowledge and education for that future. There must be co-responsibility between HEI, employers and the youth to establish bridges, create networks, find opportunities and bring forward new initiatives.

## **Transversal Key Competences, Entrepreneurship Education, e-Literacy, Media Literacy, Innovative Learning Environments**

### Citizenship education

Citizenship is maintained as an educational goal, but not as an obligatory and isolated subject, and it is made more transversal.

### Creativity & Innovation

Competences in technology transfer and commercialization have been systematically developed throughout the country and, today, most of the Portuguese universities, associated laboratories and research institutions consider specialized technical support fostering technology transfer and commercialization.

This movement has recently been strengthened through the University Technology Enterprise Network (UTEN), which has been oriented to emphasise technology transfer and commercialisation at an international scale. This initiative is promoted and supported by the Foundation for Science and Technology (Fundação para a Ciência e Tecnologia - FCT), in close collaboration with the Council of Rectors of Portuguese Universities (Conselho de Reitores das Universidades Portuguesas - CRUP) and the Portuguese Industrial Property Institute (Instituto Nacional da Propriedade Industrial - INPI) and involving strategic partnerships with leading institutions worldwide. UTEN has evolved over the past four years and its mission has been strengthened to help build a professional, globally competitive and sustainable technology transfer and commercialization network in Portugal oriented for markets worldwide.

### Programme to Combat School Failure

The early detection of students with learning difficulties, combined with better rationalisation and consolidation of programmes to combat school failure and social exclusion, will also help to increase the student success and reduce the Rate of Early Leaving of Education and Training Systems. The Government is currently assessing the results of a set of existing measures and aims to continue the educational programmes developed in Educational Priority Areas. The aim is to identify best practices and include them in a coherent and flexible programme and setting up support/funding for schools with the definition of objectives to be met.

### TEIP3 Programme

TEIP 3 Programme was created in September 2012 (link para o Despacho anexo) following TEIP 2 Programme as well as other support measures target at students from socio-economically disadvantaged areas and aiming to be an answer to their needs and expectations. Main objectives of TEIP 3 Programme:

- Improve the quality of learning, reflected on the students' achievement;
- Fight against indiscipline, early school leaving and school absence;
- Create conditions for guidance learning and qualified transition from school to working life;

- Promote articulation among school, social partners and training institutions from the education territory.

### Programa Mais Sucesso Escolar - PMSE

The programme aimed at maximizing compulsory school completing rates and to improve the quality of education by investing in multi-year or cycle-level educational strategies. It consists of strengthening student learning in the subject areas where high underachievement has been diagnosed, by reorganising the time allocated to a given subject area, and through differentiated pedagogy. To participate in PMSE, schools had to apply to the Ministry of Education and Science (Ministério da Educação e Ciência- MEC) by presenting a detailed plan of strategies to improve the outcomes of students likely to be retained. In this plan, schools also had to commit to lowering retention rates by one third each year, for four years. To make the plan feasible, the MEC would pay for additional teaching time for the implementation of the organizational measures and would give schools autonomy to manage their resources each year. Finally, the MEC also committed to providing a team of technical and academic experts to advice on aspects of implementation. Monitoring mechanisms in place, or under development: The programme is regularly assessed by the MEC. The MEC commissioned a study to a University aiming at evaluate the program. The goal of this study was to design an evaluation that would provide the necessary empirical evidence for policy-makers to make informed choices regarding the program. To do so the first two years of impact of PMSE were evaluated on a varied list of indicators, using multilevel modeling and an empirically-matched control group of schools that applied for the program and did not get it. Indicators included school success, success in high-stakes exams at the school and student level, cohort and cycle survival, and alternative education paths. In Portugal, indicators of school success regulate students' academic life, including students' year-to-year transitions and performance on specific disciplines. MEC also committed to providing a team of technical and academic experts to advise on aspects of implementation and assessment.

### Vocational Training Courses

The creation of a pilot project that aims to offer vocational training courses in primary and lower-secondary education (Ordinance no. 292-A/2012, 26th September). This aims to fully meet the fundamental needs of students and ensure the inclusion of all in education. These courses should ensure equality of opportunity, providing adequate and flexible alternatives that prepare young people for life by providing them with tools that allow them to deal with the future, as well as the challenges of the job market. The introduction of these courses also aims to develop basic schooling, promoting student participation in school activities, the assimilation of the rules of teamwork, the spirit of initiative and sense of responsibility, helping young people to acquire knowledge and develop abilities and practices that facilitate future integration into the job market. The length of these courses should not be fixed and should be tailored to the skills profile of the students on each course. When the student chooses this educational path, the aim is for their needs and expectations to match the school's educational projects and the features of the respective economic and social fabric. In addition, any student who attends these courses can return to regular education at the beginning of the following study cycle, after completing the 6th and 9th year final exams. The courses are geared towards students from 13 years old who are not well adapted to regular education and seek an alternative, particularly for those who have had to repeat a year twice in the same study cycle or three times in different cycles. Being recommended for these

courses should occur after vocational assessment by school psychologists, where this is the most appropriate match to the student's training needs. Access to these courses is not compulsory and requires parental consent.

Basic Skills (Literacy, Mathematics, Science and Technology), Languages  
In 2012, as part of the Portuguese Curriculum Structure Review, measures were implemented that focussed on three main areas:

- The updating of the curriculum, particularly via the reduction of curricular dispersion;
- Improved monitoring of students, with better evaluation and the early detection of problems;
- A crucial increase in school autonomy, in terms of managing curriculum and greater freedom to choose training and education provision.

The reduction of curricular dispersion is achieved by the consolidation of main subjects, such as Portuguese, Mathematics, History, Physics and Chemistry and Natural Sciences. It is also achieved via promoting the teaching of English, making it compulsory subject for a minimum of five years, maintaining the provision of other Foreign Languages, as well as the Expressions. Citizenship is maintained as an educational goal, but not as an obligatory and isolated subject, and it is made more transversal. This revision allows schools to consolidate autonomy in terms of pedagogy and organisation, endowing them with decision-making capacity in continuity and harmony with that of the Ministry.

The following measures were taken within the context of primary and secondary education:

- Consolidation of main subject areas;
- Making the identity of the subjects that are part of the Expressions much clearer (Visual Education, Musical Education, Physical Education and Technological Education);
- Guaranteeing more consolidated learning of English, making it a compulsory subject for a minimum of 5 years;
- Consolidating the transversal nature of Citizenship, creating syllabus content and guidelines but not making it a compulsory subject.

The following measures were taken in the 2nd cycle of primary education:

- Substituting Visual and Technological Education for Visual Education and Technological Education, each with its own programme taught by one teacher per subject;
- Experiments in Natural Sciences to be maintained and done with the entire class.

The following measures were taken in the 3rd cycle (lower-secondary education):

- Investing in scientific knowledge via the consolidation of hours teaching experimental sciences;
- Splitting class for experimental sciences via the alternation between Natural Sciences and Physics and Chemistry has been stopped;
- Providing a subject in the 7th and 8th years chosen by the school as part of its educational project;

- Improving social and human knowledge, consolidating the number of hours teaching History and Geography;
- Bringing ICT teaching forward to the 7th year, offering younger students safe and appropriate use of digital resources and providing conditions for universal access to information;
- Maintaining a second foreign language;

The following measures were taken in upper-secondary education:

- Consolidating the teaching of Portuguese, with a focus on improving students' oral and written expression;
- Maintaining the consolidated workload of biennial subjects Physics and Chemistry and Biology and Geology;
- Maintaining two annual subject options.

In parallel, Portugal is taking measures regarding more extensive curriculum revision, such as:

- Defining clear, rigorous, measurable and assessable objectives via new curricular goals and a revision and eventual reformulation of the program;
- Updating the range of options for specific training in upper-secondary education, taking into account further studies and the needs of the job market;
- Consolidating and improvement of vocational and professional provision;
- Improving academic and vocational guidance.

Bilingual Schools Project – A recent pilot initiative in early bilingual education implemented in the 1st cycle of primary in 8 school clusters at national level. It consists of delivering part of the curriculum through the medium of the English language since the beginning of compulsory education.

### Curricular goals

The curricular goals establish what can be regarded as the essential learning to be undertaken by students in each year of schooling or cycle of primary and lower-secondary education. As a reference point for teachers and parents, the goals help to identify the means necessary for students to develop the skills and acquire the knowledge which is indispensable to pursuing their studies and to the needs of today's society. Curricular goals are an initiative of the Ministry of Education and Science (Ministério da Educação e Ciência - MEC), which have emerged as a consequence of the abolition of the "National Curriculum of Compulsory Education – Essential Competencies" (Dispatch no. 17169/2011, of December 12). Together with the current programmes for each subject, the goals constitute the fundamental reference points for the development of education: they clarify the priorities in each programme, define the knowledge to be acquired and the skills to be developed by students in different school years (Dispatch no. 5306/2012, of April 2).

The drafting of goals is grounded on scientific fundamentals and studies, and takes into account goals that have been established in countries with good levels of performance. In this context, the goals now being presented are those regarded as the essential learning for students in each subject area, for each school year, or where required, for each cycle. They

highlight the teaching objectives for the current programmes and therefore constitute a standard document to be used by teachers.

As guiding principles it has been established that, because they are specific to each subject area, these goals should identify the performance associated with the knowledge to be acquired and the skills to be developed, while respecting the order in which they are to be acquired. There has been a concern to formulate them clearly and precisely in order that the teachers know exactly what it is the student should be learning. On August 10, of 2012, the Minister of Education and Science approved the new curricular goals (which replaced the previous "Metas de Aprendizagem" - Learning goals) for Portuguese, Mathematics and Technology of Information and Communication for all Basic Education. On 16 April 2013 new curricular goals for History and Geography of Portugal and Natural Sciences for 2nd cycle of basic education, and for History, Geography, and Natural Sciences for the 7th and 8th grades of 3th cycle of basic education, as well as for Physics and Chemistry for 3rd cycle of basic education, were approved by the Minister of Education and Science through Dispatch no. 5122/2013.

#### Professional Development of Teachers, Trainers and School Leaders

Currently in Portugal, an action plan is being drawn up in order to guarantee the quality, attractiveness and relevance to the job market of education and vocational training via partnership with enterprises and other bodies. This plan includes a revision of the initial teacher training model for primary and secondary education in order to improve quality, as well as redefining the system of access to the teaching profession.

In parallel with this revision, Portugal has been consolidating pedagogical and organisational autonomy of schools. This is particularly important in terms of curricular development. These schools implement the curriculum and complete it, taking into account the established general principles. Its application should be tailored to the characteristics of both students and schools. Education should accept and create the right conditions for all students, both to remedy learning difficulties and to develop student capacities. The aim is for every school to value the experiences and collaborative practices that lead to improved teaching. To this end, Portugal aims to implement the principles enshrined in the regime of autonomy, coordinating it with curriculum development, providing greater flexibility in terms of organising teaching activities, increasing efficiency in how they are distributed and improving academic outcomes, particularly via the following measures:

- Conceding hour credits, according to factors such as the efficient management of resources and the number of classes, while considering the academic progress and outcomes achieved;
- Being flexible regarding the duration of classes according to each school's individual criteria, with classes no longer having to last 45 minutes (or multiples of 45 minutes);
- Establishing a minimum time for each subject and a total maximum workload, giving schools the autonomy to distribute lessons so as to facilitate patterns or solutions that allow schools to achieve pre-established objectives in certain subjects;
- Making it possible to offer complementary cultural curricula with a flexible workload, to be used with school credit, specifically with Civics, Health Education, Financial Education, Media Education, Road Education, Consumer Education, Entrepreneurship Education and others.