PORTUGAL

Country Report on ICT in Education

Available on http://www.eun.org/observatory
Contact: Teresa Godinho, Direção-Geral da Educação (DGE)

2015
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### 1. THE EDUCATION CONTEXT

#### 1.1 KEY EDUCATIONAL CHALLENGES AND PRIORITIES

An emphasis is put on the acquisition of knowledge and skills as defined in the syllabus for each subject and in the curriculum outcomes for each school year and for each key stage. The main challenges are:

1. Attaining more efficiency in the school system;
2. Aiming at more effective learning and improved assessment;
3. Identifying students with learning difficulties with a view to better pedagogical support.

The top priorities have therefore been defined according to the above-mentioned general principles:

1. Reduction of the curriculum subject range;
2. Increasing teaching time in core subjects;
3. Reinforcement of school autonomy;
4. Improving assessment of students;
5. Making learning more effective.

Moreover, the diversification of learning paths and the efforts made to lower truancy levels and dropout rates in vocational learning pathways correspond to educational policy measures intended to meet the needs and interests of students and also the needs of the country in terms of economic development.

The guidelines for curriculum management and organisation set by the Ministry of Education and Science according to principles defined in Act No. 139/2012 are as follows:

1. Coherence in the sequence of the different levels of education, providing for smooth transitions from secondary education to higher education and employment;
2. Diversity of educational provisions, taking into account students’ needs, as well as the demands brought by national development strategies.

### 1.2 EDUCATION REFORMS

Current educational policies, as defined by Act No.139/2012, have the main goal of improving the quality of education and school success, and are based on the assumption that education is a decisive factor for the future of the country.

In order to optimise the management of the available resources, while taking into account the real needs of students and the role of the Ministry in defining guidelines, the emphasis is on the reinforcement of school autonomy, both in managing the curriculum in a progressive school autonomy context and in choosing what subjects to offer according to the overall curriculum structure. Head teachers now have more flexibility in organising school activities as well as the duration of lessons, provided the minimum amount of time devoted to each subject is respected.

The revision of the curriculum structure avoids curriculum dispersion and focuses on core subjects, namely: Portuguese, Mathematics, History, Geography, Physics, Chemistry and Natural Science. In foreign languages, an emphasis is put on the teaching of English, which is now compulsory for all students for at least seven years, beginning in the 3rd grade. All students have to learn a second foreign language.

Moreover, according to Act No. 85/2009 of 27 August, education is now compulsory until the age of 18 or until students complete their secondary education (which can occur at the age of 17 for children who start school at 5 and turn 6 by 31 December). The implementation of this measure has been subject to a phasing-in process, but now applies to all children within that age range.
2. ICT IN EDUCATION POLICY

2.1. NATIONAL/REGIONAL ICT POLICIES

In July 2012, new ICT curricular goals were defined for grades seven and eight of primary education. For the rest of the curriculum, ICT is considered as a transversal topic. Current policies capitalise on the infrastructure and equipment that have been made available to schools. Within the Ministry of Education and Science, the remit of the DGE’s Team of Educational Resources and Technology is to support schools in integrating ICT in teaching and learning activities. It runs its activities in collaboration with nine ICT Competence Centres, which are mostly based in higher education institutions. These ICT Competence Centres support schools and school clusters at all levels. Their common mission is to support schools in the educational use of ICT, and to promote innovative teaching and learning processes that will bring improvements in this area.

ICT policies revolve around five different dimensions that cater for specific needs of the Portuguese education system:

1. Integration and curriculum guidelines;
2. Research / Evaluation;
3. Creation and development of projects and initiatives both nationally and internationally;
4. Digital educational resources;
5. Teacher training.

2.2. RESPONSIBILITIES

The Federal authorities have exclusive responsibility. Responsibilities for ICT in schools are shared among several bodies of the Ministry of Education and Science:

1. The Directorate General for Education and Science Statistics (Direção-Geral de Estatísticas de Educação e Ciência – formerly the former Unit for Statistics and Planning of Education) is responsible for maintaining infrastructure and equipment.
2. The Directorate General for Education, (Direção-Geral da Educação – DGE) is responsible for education policies.
3. Municipalities are currently responsible for deploying and maintaining infrastructure and equipment in primary schools.

At school level, head teachers are responsible for organising activities and promoting collaborative work using ICT among teachers teaching the same class.

2.3. SPECIFIC ICT INITIATIVES

1:1 mobile learning initiatives (including the use of netbooks, laptops, tablets, mobile phones or other mobile devices)

2014 and 2015 have been years of increasing support for the use of mobile technologies in schools and other contexts. In January 2015, the Directorate-General for Education has organised a national conference on the topic, also with the goal to share the conclusions of the Creative Classrooms Lab project that was coordinated by EUN, in Portugal.

The following are among the projects that were gathered during the national conference:

“Leituras em Linha” (readings online)

Using tablets to promote Reading (http://leituras-em-linha.blogspot.pt/)

“Sintra e-contéudos” (e-content for Sintra)

https://lerparacrer.wordpress.com/category/sintra-e-conteudos/

For further information:

- http://tabletsnaeducacao.dge.mec.pt/
- http://creative.eun.org/
Other initiatives on the use of mobile technologies to promote learning are being developed within the School Libraries network and can be found at [http://rbe.mec.pt/np4/ideiasmerito.html](http://rbe.mec.pt/np4/ideiasmerito.html).

**Project “MANEELE”**

The pilot project ManEEle (“Manuais eletrónicos”, digital textbooks) is an initiative promoted by Alentejo’s School Directorate Services, from the Portuguese Ministry of Education and Science. The project is implemented in two school clusters. This 3 year project started in 2013 with the aim to test an alternative solution to the expanded use of digital textbooks and tablets in the classroom, through the piloting of several possibilities. It involves two 7th grade classes.

*For further information:*
- Jorge Mata (Project Coordinator of MANEELE, email: jorge.mata@dgeste.mec.pt)

**Project “TEA”**

Under the auspices of the Calouste Gulbenkian Foundation, this project aims to obtain data that allows for a thorough understanding of the following questions:

1. In what ways do students and teachers of 3rd cycle Basic and Secondary Education adjust themselves of the use of the supplied tablets?
2. What implications does this continued use of tablets have on teaching and learning; facing different professional development opportunities, which are chosen by teachers to include in their methodological repertoire and use in their teaching practice?

*For further information:*
- [http://teagulbenkian.weebly.com/](http://teagulbenkian.weebly.com/)
- [http://3ascomtea.weebly.com/](http://3ascomtea.weebly.com/)
- Project Coordinator: José Moura Carvalho, email: tea.gulbenkian@gmail.com

**“Comunidades Escolares de Aprendizagem Gulbenkian XXI” (School XXI - Gulbenkian Communities of Learning)**

The project focuses on the use of tablets in the Region of Alentejo. It is being developed by the ICT Competence Center /Research Center for Education and Psychology, Evora University and the Calouste Gulbenkian Foundation. It’s main purpose is to promote the quality of students’ learning, analysed through their school results, and materialized upon knowledge acquisition within both the formal curriculum and qualifying skills such as reasoning (analytical reasoning, practical reasoning and creativity), resilience and responsibility.

The project is being developed during five academic years: 2013/2014 to 2017/2018 and involves class monitoring (from the beginning of the 3rd until the completion of the 7th grade), involving the first three education cycles of the Portuguese schooling system. Three public schools of three different school clusters participate. Each school involves two classes of students from the third grade and their teachers.

The project also involves engineers and technicians, other teachers, schools directors, representatives of the local communities, and civic, sport and cultural associations. Finally, the project involves a group of researchers, professors and research fellows (PhD) responsible for the design, implementation, evaluation and monitoring of the project; particularly of the scientific, pedagogical and technological areas.

*For further information:*
- Professor José Luís ramos, University of Évora, email: jlramos@uevora.pt
Learning Analytics

There are no national initiatives on learning analytics. However, several research projects on the topic started, for example a project of the Portuguese Catholic University.

For further information:

http://repositorio.ucp.pt/handle/10400.14/14599
http://www.researchgate.net/publication/235934007_Tecnologia_Inovao_e_Educao_Impl-lementao_de_um_sistema_de_Learning_Analytics

MOOCs for teacher professional development or initial teacher training or MOOCs for students, including certification

The Portuguese Open University and several other Portuguese universities and institutions offer MOOCs to train students but also for teacher’s professional development.

The first MOOC in Portuguese language was held in 2013 (http://mooced.blogspot.pt/p/mooc-ead.html) and it was precisely on Distance Education. A master thesis on the topic is available.

DGE’s MOOCs

The Directorate-General for Education was responsible for two MOOC initiatives so far:

- Digital safety – MOOC 2014: 500 participants; 140 with certification
- The eTwinning MOOC: 520 applicants, 180 participants with credits, 340 teachers enrolled in the course with certification (no credits)

University initiatives

- Platform of the University of Coimbra: http://www.ed.uc.pt/educ/cursos
  - e.g. course on creative writing: http://www.ed.uc.pt/educ/curso?id=40
- Platform of the Leiria Polytechnic Institute: http://up2u.ipleiria.pt/
- MOOC on Bullying in School Contexts, the Santarem Polytechnic Institute: http://moocbullying.blogspot.pt/2012/11/blog-post.html
- Initiative on MOOCs, Oporto University: https://elearning.up.pt/mooc/

Other initiatives

- The site https://www.mooc-list.com/countries/portugal lists seven other initiatives from Portugal.
- The platform http://www.openuped.eu lists one MOOC course from Portugal, precisely from Open University.
- Finally, Portugal participates in the Home project (http://home.eadtu.eu/), which has already produced the Oporto declaration on MOOCs among other deliverables http://home.eadtu.eu/images/News/Porto_Declaration_on_European_MOOCs_Final.pdf

For further information:

- Portuguese Open University: http://eco.imooc.uab.pt/elgg/
- Professor António Teixeira, email: Antonio.Teixeira@uab.pt

ICT for inclusion (early school leavers, migrants, etc.) and special needs (physical, mental, emotional)

ICT for inclusion in educational context (special needs students) is a responsibility of the Directorate General for Education.

For further information:


Accessibility has been one of the main concerns. Portugal participates in two European funded projects in this area:

- ICT4IAL: http://www.ict4ial.eu
In the school year 2013/2014, 1435 students with special needs were supported by the network of ICT resource centres. At the centres, technicians recommend assistive technologies for students with special needs (whenever possible free software). The Ministry of Education also funds and supports the use of these products. An example of the work of the ICT Resource Centers can be found at https://youtu.be/3oFcxksBuaM

Furthermore, since 2011 the group “Media and Handicap” aims to contribute to discussions on disability issues and receives an increasing media coverage in different media (traditional and online). It also fosters greater involvement, commitment, performance and contribution of the media and its practitioners, through concrete actions. One of the actions is to allow an increasing access of people with disabilities to media content and ICT.

For further information:

- http://www.mediaedeficiencia.com/

ICT for learning initiatives targeted to boost employability and entrepreneurship

On 24th June 20115, the National Strategy and Action Plan for Digital Employability was presented.

Portugal has participated in an eSkills initiative and held a national conference on 2nd December 2014. The conference objectives were:

- to inform young people of employment opportunities created by digital technologies;
- to foster interest in pursuing careers related to ICTs (a sector with a growing need for specialized human resources);
- to create opportunities for strategic partnerships.

For further information:


Cloud computing and connectivity (e.g. wireless Internet, optical fibre connections)

The Edulabs initiative aims to build clever classrooms, school learning laboratories where technology and new approaches to teaching and learning bring innovation to the classroom. Edulabs is developed with the support of the Directorate-General of Education and the ICT Competence Center of the University of Aveiro. E.xample, a technological company, is coordinating the project.

According to it’s website, the birth of a technology ecosystem in an area critical to the economic development of countries, such as education and learning, is an experience of entrepreneurship and innovation that led to the formation of a consortium of companies that form E.xample and whose main aspects are:

- Laptop computers
- Interactive Whiteboards and Tablets
- Local area network
- School Servers
- Application and school management software
- Interactive digital content
- Energy efficiency systems
- Program management and control
- Roll out management
- Consultancy in ICT in education and learning models.

For further information:

- http://www.e-example.com/Noticias/encontro_nacional_de_edulabs
Other ICT initiatives of interest to other policy-makers

Recent initiatives:

Apps4 Good

Portugal participates through the Educational Resources and Technologies Team, within the Directorate-General of Education (DGE) in the initiative Apps For Good which is developed by CDI, an international NGO.

In the school year 2014/2015, it has involved 16 schools, 20 classes, 32 teachers and 300 students. The aim is to build a new global generation of problem solvers and makers: students who can create, launch and market new products that change the world. The coordinators of this initiative believe that technology can be a great equaliser and a massive force for good to transform lives and communities around the world. According to the initiative’s website, “Apps for Good is an open-source technology education movement that partners with educators in schools and learning centres to deliver our course to young people, 10-18 years old. We provide the course content, training and connections to our Expert volunteers, and then support teachers to do what they are best at – inspiring and guiding young people. In the course, students work together as teams to find real issues they care about and learn to build a mobile, web or social app to solve them. Like professional entrepreneurs, students go through all key aspects of new product development, from idea generation, technical feasibility and programming to product design, deciding on business models and marketing.”

For further information:
- http://erte.dge.mec.pt/index.php?ac-

Experts:
- Expert: João Baracho CDI (email: joao.baracho@cdiglobal.org)

Teachers Try Science

In the academic year 2014/2015, The Directorate-General for Education and IBM Portugal promoted the Pilot Project “Teachers TryScience”. This initiative is intended to challenge teachers and students to submit original works, in order to promote scientific literacy. The idea is to sparks students’ interest in science and technology through the construction of a vertical garden. Teachers are challenged to develop a set of activities, teaching strategies and resources. The evaluation and monitoring was carried out by the EDUCOM ICT Competence Center.

For further information:
- http://tryscience.org/
- Expert: Sara Cardeira, IBM (email: saracardeira@pt.ibm.com)

Coding in Basic Education

The DGE launched a pilot project, promoting the Introduction to Programming in the 1st cycle of basic education, challenging Portuguese public schools to take part in the initiative during the academic year of 2015/16 with their students of 3rd and 4th grades. This initiative could be streamlined as a complimentary offer or in curricular enrichment activities.

For further information:

Robotics and programming

The DGE conducted a census of the various programming and robotics clubs existing in national public schools and launched then a contest supporting the activities of those clubs.

For further information:
Learning Labs (FCL Ambassadors)

This initiative is developed by the DGE in partnership with European Schoolnet (EUN), consisting in the dissemination of methodologies for the curricular integration of ICT that have been validated at European level with iTEC, LSL, CCL and other finished projects. So far, 22 workshops have been organized nationwide and 500 teachers were reached.

Portugal is disseminating Future Classroom Methodologies through a national level initiative of Teachers trainers training involving the five FCL Ambassadors and 82 teacher trainers (from the 90 Teacher Trainers Centers) that will disseminate these innovative methodologies.

Continuing initiatives:

European projects

The Ministry of Education and Science, through the DGE, is involved in several European projects, most of them led by European Schoolnet:

- eTwinning
- InSafe
- Lingu@network (finished in March 2015)
- Creative Classrooms Lab (finished in May 2015)

For further information:

- http://programacao1ceb.dge.mec.pt/
- http://cpr.dge.mec.pt
- Expert: Teresa Godinho, Educational Resources and Technologies Team, DGE (teresa.godinho@dge.mec.pt)

National projects:

A. Webinars – The DGE holds regular video-webinars for teachers on educational topics (curriculum development, innovation, digital technology, etc.)

B. ‘Tell us a story!’ - Podcasts in Education – This initiative was launched in 2009/2010. It aims to promote and support the educational use of podcasting (audio and video) tools. The initiative involves teachers and students at pre-school and primary level.

C. School Radio and TV projects on the Web – This initiative aims to support the implementation of Radio and Television projects in schools as well as to share good practices in this context. Teachers share resources and experiences through a Moodle forum. A yearly event allows teachers and students to get together and share their projects.

D. School Newspapers: This initiative aims not only to support, but also to disseminate good-practice of using newspapers in educational contexts, taking account of the work done by teachers in schools with their students. It wants also to provide teachers, students and schools with the knowledge and tools that enable them to make the digital edition of their school newspapers, giving rise to new formats or even to new projects. School newspaper project coordinators may register using the form available in order to streamline the school cluster. After the registration process, the Journal, after approval, is published in DGE’s platform.

E. Digital learning resources available in the Schools Portal – The DGE is responsible for managing the education repository at the Schools Portal as well as for validating its digital learning resources.
F. Educational Blogs catalogue – In March 2011, the DGE launched an educational blogs catalogue to support schools in using blogs as an educational strategy and resource. The catalogue offers technical and pedagogical support in the use of blogs in schools and also shares good practice. There are more than 300 blogs already registered, covering primary school activities, library school projects, science clubs and many other types of school projects.

2.4. ICT PRIORITIES

A: Digital Competence Development

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<thead>
<tr>
<th>Area</th>
<th>High</th>
<th>Mid</th>
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<tbody>
<tr>
<td>Developing measures to support digital competence for future teachers</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Developing measures to support digital competence for in service teachers (a)</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>Developing measures to support school leaders in the integration of ICT</td>
<td>X</td>
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<tr>
<td>ICT for learning initiatives targeted to boost youth employability and entrepreneurship (b)</td>
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<tr>
<td>ICT for accessibility and inclusion: early school leavers, migrants, etc... and special educational needs (c)</td>
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Reference to policy action measure related to Digital Competence Development:

- Coding initiative (a)
- INOVA Contest: (b) [http://www.iniciativaoinova.pt/](http://www.iniciativaoinova.pt/)

B: ICT in Curricula and Assessment

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<th>Area</th>
<th>High</th>
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<tbody>
<tr>
<td>Developing computer/programming skills</td>
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<tr>
<td>Developing key competences</td>
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<td>X</td>
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<tr>
<td>Developing 21st century skills (critical thinking, problem solving, communication, collaboration, and creativity and innovation)</td>
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<td>Assessing with ICT/ICT based exams</td>
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<td>Learning Analytics</td>
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C: System-wide innovation

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<th>Area</th>
<th>High</th>
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<tbody>
<tr>
<td>Piloting and validating innovative uses of ICT</td>
<td>X</td>
<td></td>
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<tr>
<td>Mainstreaming ICT in schools</td>
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Reference to policy action measures related system-wide innovation:


D: Mobile Devices

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<th>Area</th>
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<th>Low</th>
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<tbody>
<tr>
<td>Use of tablets</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>Use of mobile phones</td>
<td></td>
<td>X</td>
<td></td>
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<tr>
<td>Bring Your Own Device</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cloud computing</td>
<td>X</td>
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E: Use of digital resources

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<tr>
<th>Area</th>
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<tbody>
<tr>
<td>Developing educational content repositories/metadata</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>Supporting the development of open educational content and resources</td>
<td>X</td>
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<tr>
<td>Supporting the development of educational content/resources provided by</td>
<td>X</td>
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3. THE CURRICULUM AND ICT

3.1. ICT BASED ASSESSMENT

Portugal still does not have a national initiative regarding ICT-based assessment. However, there have been developments in several Portuguese schools participating in iTEC, namely using Learning Response Systems and the Team Up online application.

The use of Daisy/EasyReader software to adapt learning materials and school texts for students with special needs has been implemented in the last years by the DGE’s Special Needs Services.

3.2. SCHOOL IMPROVEMENT WITH ICT

In this area, the Digital Safety label project helped schools to assess how their use of ICT raises safety issues. The e-safety community helps school directors and teachers to face problems regarding their use of ICT and their immersion in digital spaces.

See infographic: http://www.esafetylabel.eu/web/guest/infographic

The Directorate General for Statistics in Education and Science (DGEEC) has a digital safety area which also helps schools with their learning environments using ICT. DGEEC promoted several studies evaluating the impact of the Portuguese technological plan:


3.3. THE CURRICULUM FRAMEWORK

The Portuguese curriculum is defined at national level and is goal-oriented. School autonomy is reflected in the fact that one subject can be chosen by each school, taking into account curricular guidelines.

The general curriculum framework for schools is based on the development of students’ knowledge and a set of essential structuring skills that aim at:

1. Guaranteeing all Portuguese citizens a common general education that ensures that they discover and develop interests and aptitudes and promotes individual fulfilment, in harmony with the values of social solidarity;

2. Developing national awareness open to realities in a context of universalist humanism and international solidarity and cooperation;

3. Furthering the acquisition of independent attitudes in order to raise citizens with a sense of civic responsibility who participate democratically in community life.

3.4. ICT IN THE CURRICULUM

ICT has been integrated as a tool across the entire curriculum. In 2009/2010, learning targets for ICT were defined for all curriculum areas in all four cycles of the Portuguese education system (1st Cycle):

- pre-school, primary grades 1 to 4;
• 2nd Cycle: primary grades 5 to 6;
• 3rd Cycle: primary grades 7 to 9;
• 4th Cycle: secondary grades 10 to 12.

ICT is now a subject in its own right in grades seven and eight (age 12-13).

3.5. STUDENTS’ ICT COMPETENCE

ICT is taught as a subject in its own right in grades seven and eight. Schools can opt for 90-minute classes for one semester or 45-minute classes over the whole school year. ICT is a mainly practical subject, organised in three areas (the topic of digital safety is covered in all areas):

1. Information;
2. Production;

Students must be active users of computers, networks and the internet. Based on the ICT curricular goals, teachers should create learning situations that promote students’ autonomy. Goals should therefore not be seen as a list of topics to be imparted to students in a sequential way, but rather as learning goals, regardless of the sequence that the teacher chooses to follow during each school year. It should therefore be noted that the numbering of the objectives and descriptors does not indicate or suggest a compulsory sequential approach.

The curricular goals set out the essential learning that should be undertaken by students in Information and Communication Technology in the grades 7 and 8. These learning areas are organised in domains, sub-domains and overall goals.

3.6. ASSESSMENT OF ICT COMPETENCE

ICT competence is currently assessed as a subject (mandatory in grades seven and eight), and in some ICT specific subjects (grade 10 to 12), depending on the area chosen by the student. Very few students take the ECDL exam.

Media Literacy (including the use of ICT) has been assessed in a pilot project of the University of Minho, National School Libraries Network and the Portuguese Office for the Media. The results of this study are being published in the end of June 2015.

4. DIGITAL LEARNING RESOURCES AND SERVICES

4.1. E-CONTENT DEVELOPMENT

E-content is developed mainly by educational publishers. The two main players are:

• LeYa, one of the most important Portuguese textbook publishers, has developed Platform 20, providing access to learning resources such as digital textbooks, videos, animations, games and interactive tests (www.leya.com).

• Porto Editora, until recently the main Portuguese educational publisher, runs the Virtual School portal where it sells multimedia products and maintains the largest collection of commercial interactive online resources for all subjects in the Portuguese curriculum (www.portoeditora.pt).

• The Casa das Ciências (House of Science), funded by the Calouste Gulbenkian Foundation, is a project that fosters the creation of digital learning resources by secondary school teachers through support from higher education teachers. The project maintains a fairly large repository of digital learning resources (DLR) aimed at STEM teaching and learning.

In addition, there are several initiatives for the development of e-books, but these are local and rather narrow in scope. The ICT Competence Centre of the School of Education of Santarém has specialised in the development of e-books, but currently only has a small selection. More e-books
are still to be produced and further titles will be published by the end of the current school year.

Moreover, in projects such as iTEC, teachers and students who have taken part in various piloting cycles have created internet-based learning materials that are still to be disseminated.

http://itec.eun.org/

Finally, the POERUP initiative has gathered useful information on the Portuguese initiatives on Open Educational Resources.

http://poerup.referata.com/wiki/Portugal

### 4.2. CONTENT SHARING

A repository of digital content for teachers and students called **Portal das Escolas** (Schools Portal) was launched in 2009. On the Schools Portal, teachers can find relevant information about schools and their educational communities as well as a repository of over a thousand digital educational resources that can be used in teaching. These resources include text, images, videos and sounds. After registering, teachers in public education can upload educational resources to this repository; all uploaded resources are validated by a team of teachers who have been trained in digital learning resource evaluation in digital learning resources. All users can also search the Learning Resource Exchange, a European repository that can be reached from the Schools Portal; this repository offers many resources that meet travel criteria well. Unregistered users have access to all validated content, while registered users (teachers only) have access to all resources.

The DGE also promotes projects and partnerships for content sharing. **GEORED**, for example, is a DGE-funded collaborative project between the Geography Teachers Association and the Department of Geography at the University of Lisbon. GEORED consists of a web portal where digital resources are made available under a Creative Commons license. These resources aim to develop geographical skills in the use of digital maps and Geographic Information Systems.

In early 2013, the Ministry of Education and Science, through the DGE, launched an iTunes U space. The digital resources for the space were produced under various initiatives and projects aimed at innovation in educational practices and the improvement of learning outcomes. Resources will be available in different formats (PDF, audio and video) across four distinct collections:

- Publications and studies in the areas of Portuguese, Mathematics, Science and ICT;
- Video recordings and webinars;
- Resources produced in the context of a national call for the creation of podcasts Conta nos uma história! (Tell us a Story) aimed at kindergarten and primary school children and their teachers (see Section 2.3 Specific ICT initiatives).

The number of resources available on the iTunes U space will be increased regularly. The iTunes U DGE space will later include courses outlines that can serve as an inspiration and model for Portuguese teachers, who will also be invited to build their own courses. Any teacher can collaborate in this space by creating courses that meet curriculum guidelines. These courses will be validated before publication and made available to the public. In 2013, a similar space was created for windows users, within Win 8 apps (APP DGE).

Finally, there are numerous other websites that offer access to a selection of open educational resources for school education. Two initiatives worth mentioning are **R21**, a repository of over 2,000 open educational resources, many of which are aimed at the use of interactive whiteboards, and the **Casa das Ciências**, a project financially supported by the Calouste Gulbenkian Foundation, aimed at STEM teachers. The latter project supports STEM teachers in creating their own Digital Learning Resources (see Section 4.1 E-Content development).
4.3. ACCESSIBILITY FOR LEARNER WITH DISABILITIES AND SOCIAL INCLUSION

In 1999, Portugal was the first country in Europe and the fourth country in the world to approve legislation aimed at ensuring the accessibility of central government sites to people with special needs, as part of the National Initiative for Citizens with Disabilities adopted by the Council of Ministers Resolution No. 96/99 of 26 August. The Council of Ministers Resolution No. 110/2003 of 12 August and the Council of Ministers Resolution No. 9/2007 of 17 January maintained, among other things, the objective of improving the accessibility of Portuguese government sites, including educational sites.

For more information, see also Section 2.3 Specific Initiatives.

4.4. WEB 2.0

In Portugal, there have been several initiatives to promote the use of web 2.0 tools in schools for teaching and learning. In 2008, a major event on web 2.0 tools took place, as a result of which a handbook on the use of web 2.0 tools in schools was created. This handbook is freely available online:


Moreover, in March 2011 the DGE launched an educational blog catalogue to support schools in using blogs as an educational strategy and resource. The catalogue offers technical and pedagogical support in the use of blogs in schools and also shares good practice. There are more than 300 blogs already registered, covering primary school activities, library school projects, science clubs and many other types of school projects.

Tools such as blogs, wikis, podcasting, social networking and sharing services (websites, images, videos, audio files, etc.) are frequently used in our educational system. It is therefore necessary to provide teachers and trainers with the skills for the use of such tools in a creative and reflective way, thus fostering the creation of new learning spaces. The use of web 2.0 tools in educational contexts leads to the creation and design of learning activities that are interactive and culturally engaging.

4.5. LEARNING PLATFORMS

The Escola Móvel (Mobile School) project – now called Ensino a Distância para a Itinerância (Distance Education for Itinerant Students) – emerged as a distance learning project using the Moodle learning management system (LMS). The project supports lower secondary school students who are children of occupational travellers in their learning, aiming to meet the specific needs of this community in terms of basic education. Initially the Escola Móvel curriculum consisted of the subjects that make up the National Curriculum for lower secondary education, with the exception of Physical Education. The Escola Móvel project extended its educational provision and implementation of distance education, ensuring the integration of different students by providing compulsory schooling, with the possibility of continuing studies in upper secondary education. The project was expanded to include other children who are at risk of failure in their school results, of dropping out or of social exclusion, and especially young people supported by the Ajuda de Mãe (Mother’s Help) institution and students older than 15 years who, for various reasons, have not completed their compulsory education. The project aimed to provide differentiated learning contexts and individualised tutoring, working closely with local education authorities. The project is a partnership with a Lisbon-based school that hosts the virtual school in its premises and offers its organisational and financial infrastructures. In the school year 2011/2012, 23 teachers worked on the project, reaching over one hundred students. Students are
grouped in classrooms and have to be online according to a traditional school subject-based timetable; at the end of compulsory schooling they sit the same exams as all other students in Portugal.

**Moodle**

In Portugal, every school teaching grades 5 to 12 has a Moodle learning platform. This platform is used as a means of communication within the school community and as a workplace for students and teachers. The use of learning platforms is disseminated throughout almost every state-run school and a 2006 initiative encouraged schools to use Moodle. A national study of this initiative shows that over 98% of participating schools use Moodle as an LMS platform. The fact that the Moodle LMS software is free, open and fully customisable seems to be a crucial factor in its spread among national schools. Findings also suggest that, other than Moodle, schools tend to favour open-source rather than commercial software.

The high percentage of schools using Moodle as shown by this survey can be seen as a favourable factor towards the acquisition, development and establishment of regular usage habits, since it is part of both a shared language and a shared repertoire, collectively understood among teachers, pupils and the wider school community. Moreover, since all features are integrated in the same space and the potentials of the tool (resources, modules, activities) are known, it is easier to create support and cooperation networks among users, e.g. teachers of the same school/cluster or among teachers from different schools throughout the country.

### 5. TEACHER EDUCATION FOR ICT

#### 5.1. ASSESSMENT SCHEMES

The monitoring of the training and certification system for ICT competences was conducted within the scope of the organic and operational structure of the Technological Plan for Education. The Education Planning and Statistics Office develops and maintains the information support system for training and certification of ICT competences. There are currently no new actions identified in this field.

#### 5.2. SCHOOL LEADER SUPPORT

The Portuguese Ministry of Education supports the Microsoft initiative for Innovative Leaders. The **Innovative Leader Program training program** aims to enable School heads to implement change and forward thinking in the institutions they lead. Through the development of improvement plans, and under the mentoring of business leaders, this program aims for school heads to:

- Develop management and leadership skills;
- Identify areas for improvement of the performance of their schools;
- Create and implement a Plan for Change;
- Promote contacts and exchange between schools and companies;
- Promote innovation and improved performance of their schools.


#### 5.3. ICT FOR INCLUSION

**National Strategy for inclusion**

National plans and strategies to include people with disabilities were conceived within the framework of the **Convention on the Rights of Persons with Disabilities** and the **European Strategy for Disability** (2010-20).

The first **National Action Plan for the Integration of People with Disabilities** was launched in 2006. The **National Strategy for Disability** currently in force defines the following measures for the education sector:

1. To implement the Early Childhood Intervention system;
2. To continue the inclusion of children with disabilities in mainstream schools, moving away from special needs institutions;
3. To reinforce and make the necessary changes regarding specialised units and reference schools to support children with multiple disabilities or autism spectrum disorders and blind and deaf children;
4. To provide every student with SEN with the adequate instructional adaptations or modifications to achieve the educational objectives defined in the respective Individual Educational Plan (IEP);
5. To reinforce teachers' training regarding special needs;
6. To reinforce school assistants' training regarding special needs;
7. To create virtual communities of SEN teachers;
8. To promote the transition of students with SEN from school to an active life.

Most of these measures have already been implemented but require further development and reinforcement. Other education and training measures included in the National Strategy are the co-responsibility of other Ministries.

Reorganisation of Special Needs Education

In 2008, a law was passed governing special needs provision in schools, addressing the measures referred to by the National Strategy. Moreover, several publications with curricular guidelines were produced by the Ministry of Education to help schools and teachers to integrate students with SEN. The aim is that these measures and the respective support will benefit students with severe needs (http://dre.pt/pdf1sdip/2008/01/00400/0015400164.pdf).

To concentrate resources for the support of students with SEN, reference schools for blind/visually-impaired and deaf students were selected and provided with specialised human resources. As the number of students with multiple disabilities and autism spectrum disorders has grown, special units have been opened in many schools to support the inclusion of these children.

Special needs institutions that used to take care of the majority of children with severe special needs who now attend mainstream schools established agreements with the Ministry of Education to provide technical/therapeutic support to these students. Staff from these institutions usually provide services in schools according to the special needs of the child, as identified by the schools' special needs teachers and technical/therapeutic staff of the institutions.

ICT Resource Centres for Special Needs

A network of 25 ICT Resource Centres for Special Needs was created to provide evaluation services to students with disabilities and to recommend assistive technology (AT), granting them digital accessibility. These centres are located in schools, covering other schools from a neighbouring area. They assess students with disabilities regarding their needs for ICT and AT. Since 2009, the centres have recommended AT to students, which is financed by the Ministry of Education.

ICT Resource Centres for Special Needs have other complementary tasks, namely:

1. Training teachers in the use of ICT and assistive technology;
2. Raising awareness of the benefits of such media among parents and school staff;
3. Establishing partnerships with Higher Education Units (devoted to AT and special needs research), private associations specialised in special needs, health services and companies specialised in AT.
Guidelines for the activities of the centres were defined at central level, which determine that they must present an Annual Activity Plan as well as an Annual Report. Every year, the reports are analysed and a global report of the network’s activity is made publicly available.

ICT Resource Centres play an important role in the dissemination of ICT and AT. In collaboration with companies that deal in AT, the centres organise public sessions addressing teachers, technical staff and parents. They also organise online teacher training on specific software. Peer training, either on an individual or small group basis, is also carried out by the ICT Resource Centres for Special Needs. Formal teacher training in the field of Special Needs and assistive technology is also provided by the Teacher Training Centres, certified for career development.

ICT and assistive technology can make a big difference to the autonomy of people with disabilities. If the appropriate devices are made available, people can act more independently. To help students to become autonomous learners and to witness such an accomplishment can be rewarding for any educator. Educators can obtain expertise through training, experience and help from other experts. Partnerships with entities with expertise in the different fields of disability are crucial.

Virtual Communities of SEN Teachers in Moodle

Virtual communities were created on the DGE’s central Moodle platform, gathering the teams working in the 25 ICT Resource Centres, SEN teachers working in reference schools for blind and deaf students and SEN teachers working in special units for multiple disabilities and autism spectrum disorders.

In the case of the ICT Resource Centres, working documents as well as messages and resources are frequently exchanged, namely:

- Repository of special needs resources;
- Case studies;
- Videocasts;
- Online training courses.

Videoconference for Students with SEN

An agreement between the Ministry of Education and Portugal Telecom (PT) is maintained to provide a (limited) number of videoconference systems to students who are absent from school due to chronic illness (most cases are linked to cancer). Students have periods of hospital treatment and recovery at home that lead to absence from school, and videoconferences allow them to keep in touch with teachers, classmates and learning activities. The technological solution provided by Portugal Telecom includes common functionalities such as chat, file sharing and application sharing, as well as an extra functionality that gives the student at home remote control of the camera (position and zoom) installed in the classroom. Other free videoconferencing tools have been recommended by the ICT Resource Centres to meet the needs of other students.

Digital learning resources and services

Daisy implementation

The adoption of Daisy/EasyReader software to adapt learning materials and school texts for students with SEN has been implemented in recent years by the Special Needs Services of the DGE.

Universal design stories

Children’s stories with school activities in a universal design have been produced and supported by the DGE’s SEN services, including sign language, Braille and pictographic versions.

Repository of free/shareware

A website with a repository of free/shareware tools and free resources was created. This website compiles many free applications for accessibility and other assistive aids. It is a repository that collects freeware for different purposes, including:

- AAC (symbol communication);
- Screen readers;
• Magnifiers;
• Speech syntheisers and voice recognition;
• Virtual keyboards and other.

The repository also includes other free learning resources, as well as a blog with videos regarding inclusion and special needs. The ICT Resource Centres produce free resources and promote the use of free tools among teachers to create and adapt their own materials.

Link: http://freewarenee.weebly.com/

Web Accessibilities

One of the measures included in the National Strategy for Disabilities is the need to make school website more accessible. Awareness-raising activities will be organised by the ICT Resource Centres.

5.4. ICT IN INITIAL TEACHER EDUCATION

Initial teacher training is the responsibility of Higher Education institutions. The training provided aims at strengthening and promoting certain skills. The aim is to overcome the main factors that inhibit the technological modernisation of the education system by promoting the use of ICT in teaching and learning and in school management and by training teachers in the pedagogical use of ICT and in the mechanisms for certification of ICT competences.

In Portugal, institutions have autonomy in this area and are therefore free to decide whether or not to include ICT in initial teacher education. Nonetheless, most institutions that are responsible for initial teacher training provide ICT as a basic study.

5.5. ICT IN IN-SERVICE TEACHER EDUCATION

Teacher Training Centers are deploying ICT training according to specific school necessities, namely on the use of Interactive Whiteboards (IWB’s), web 2.0 tools, learning platforms and cloud-computing. During 2015, the “Learning Labs initiative” developed several workshops in collaboration with Teacher Training Centers, in order to present innovative methodologies developed in the Creative Classrooms Lab project. See also Section 2.3. Specific ICT initiatives

ICT in-service training is not compulsory. One of the main areas of intervention of the Portuguese Technological Plan was training. Legal guidelines concerning teacher training and certification on ICT competences were therefore compiled. Ordinance 731/2009 of 7 July defines the training and certification system on ICT competence for teachers of all school levels. This system is organised on three levels, in accordance with the principles of strengthening, diversifying and progressively increasing skills and professional contexts of the use and integration of ICT. The system fosters both the acquisition of new knowledge on the pedagogical use of ICT and the validation of skills acquired outside the legal framework for in-service teacher training. The aim is to take into account the knowledge acquired during additional specialised academic training and the knowledge acquired during the professional teaching career. As a result, one-third of Portuguese teachers received training and were accredited.

5.6. TRAINING THE TEACHER TRAINEES

In the most recent initiatives, training of teacher trainers covered four main areas:

- Future Classroom Methodologies: following the exploitation guidelines of several European levels such as iTEC, Living Schools Lab, CPDLab and Creative Classrooms Lab, innovative methodologies are disseminated in Portugal.
- Internet safety: This is a central issue as well as a good starting point to address several uses of ICT in, and even beyond, school. Internet safety is a starting point to develop a
number of skills necessary for the 21st century teacher.

- **The pedagogical use of Interactive Whiteboards (IWB’s):** A large number of courses addressing the specific uses of IWB’s have taken place all over the country. The aim was to discover IWB’s as a tool that can motivate students but above all to promote new methodological approaches for the teaching and learning process.

- **ePortfolios:** Following a recommendation from the Ministry of Education on the use of ePortfolios for students in compulsory education, a training session for teacher trainers took place addressing the pedagogical use of ePortfolios, RePe (Repositório de ePortefólios educativos – Repository of Educational ePortfolios).

As a result of the above mentioned EUN projects, five Future Classroom Lab Ambassadors are disseminating FCL methodologies through several workshops at national level, with the collaboration of the School Associations Teacher Training Centres and three editions of a Teacher Trainer Training Course in a blended format.

6. **ICT STUDIES**

The Educational Resources and technologies Team from the Directorate-General for Education has gathered ICT studies that are available on the DGE website: