Mobile Education in Spain

This document is part of a series of country specific reports which consider the demand for Mobile Education from the formal education sector perspective.

Foreword

For the Education sector, mobile connectivity provides an opportunity to offer new ways of teaching and learning that ultimately will improve performance and results whilst at the same time open up new markets for mobile operators across the world. Mobile will increase access to up-to-date materials, will enable collaboration and strengthen learner engagement. In response to this opportunity, the GSMA's Mobile Education initiative aims to accelerate the adoption of Mobile Education solutions; in particular, the use of mobile-enabled portable devices, such as e-Readers and tablets in mainstream education settings.

This document is part of a series of country specific reports which consider the demand for Mobile Education from the formal education sector perspective in each country. In each we describe the delivery models in place for the main types of education along with examples of activities already underway. To date country specific reports have been developed for the United States, United Kingdom, Spain, Japan and France.

The GSMA Mobile Education Landscape Report describes the market for Mobile Education from a global perspective, focusing on the supply side. It describes trends, key players and current initiatives in the emerging Mobile Education and related e-Textbook publishing markets. An accompanying background document; Education Systems – A Brief Introduction gives background on how education segments and systems function and describes flows of funding.

We encourage you to get involved, whichever part of the ecosystem you belong to, please contact **mobileeducation@gsm.org** to learn how.

GSMA Mobile Education

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Background

This report on Mobile Education in Spain is one of a series of reports, which collectively describe the emerging market for Mobile Education. At a country level, as well as this report on Spain, there are reports on the United States, the United Kingdom, Japan and France. These country-specific reports focus primarily on the demand side of Mobile Education. The Mobile Education Landscape Report considers the development of Mobile Education from a global perspective, focusing more on the supply side. An accompanying primer on education systems gives background on how education segments and systems function and describes flows of funding.

Objective

The key objective of this report is to examine the current take-up and uses of Mobile Education technologies across different education segments in Spain and explore possibilities for their expected growth.

Structure

The report opens with a summary of the key takeaways, including the specific barriers facing Mobile Education in Spain. This is followed by a high level overview of the education system.

The report then describes three different education segments: schools, technical and vocational education and training (TVET), and higher education. For each segment, we describe the education system and give context on use of technology. We then look at the development of Mobile Education, describing what is already in place in terms of a 'Mobile Education ecosystem', identifying and describing selected initiatives and drawing out lessons learned.

Target Audience

The target audience for this report is managers from:

- Mobile ecosystem organisations responsible for consumer devices, institutional customers or M2M services.
- Education content organisations looking to expand in to Mobile Education.
- System and software developers with an interest in developing Mobile Education solutions.
- Government departments or education institutions wishing to understand more about the landscape of Mobile Education in Spain.

Definitions

The main focus of this report is Mobile Education, which is interpreted as:

- Use of individual, portable devices (e.g. e-Readers, tablets, Personal Digital Assistants (PDAs), and smartphones), which make use of the mobile network (i.e. are SIM-enabled).
- Used in mainstream education settings (e.g. primary, secondary, college, workplace, distance learning, professional qualifications), therefore aligning with curriculum objectives or used for high-stakes assessment, and will cover both learning (e.g. interactive learning), content (e.g. text books) and administration (e.g. school records, attendance, communications).

For the country reports, we describe the use of Mobile Education across the three main education segments, which can be defined as:

- **Schools:** learning is delivered only in formal education settings in specific institutions with clear flows of funding.
- **Technical and Vocational Education and Training (TVET):** learning is delivered in a wide variety of settings, including formal education institutions, the work-place, via distance learning and in casual or self-directed settings (the latter are informal learning settings). Activities can include learning for qualifications, training for specific tasks or skills, training for 'softer' management skills, leadership development skills, certifications, professional training, etc. Mostly formal settings are described in this report.
- **Higher Education (HE) (also referred to as Tertiary Education):** learning is delivered mostly in formal education settings in specific institutions with clear flows of funding, but can also be delivered as distance learning.

The school and higher education systems are generally clear and straightforward to describe, but the systems for TVET can be more complicated. In part this is because they typically overlap with the school and higher education sectors, but also the policy focus can be quite variable.

2 Key Takeaways

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The main points about education and Mobile Education in Spain are:

- Autonomous Communities (regional governments) play a significant role in the governance and delivery of education, in both schools and higher education. They are likely to be involved in most ICT purchasing decisions, although universities have more independence.
- Two key and potentially transformative initiatives are centrally led. The Escuela 2.0 programme is revitalising the use of ICT in schools, with a major focus on distributing 1:1 devices to students. Similarly ground-breaking is the creation of a national repository of digital content, Agrega, with content from each Autonomous Community. In higher education, there is also a solid ICT infrastructure and lots of uses of ICT. However, ICT has yet to impact significantly on innovative content and new teaching and learning pedagogies.
- There is little to say about a market for Mobile Education developing in Spain, although Escuela 2.0 could change this. It is already evident that publishers are beginning to develop more digital content under this umbrella and the expansion of 1:1 devices could also lead to more demand. In higher education, there is little evidence of a focus on Mobile Education, with the exception of one stand-out institution, the Universitat Oberta de Catalunya.
- The specific challenges for the development of Mobile Education in Spain are:
  - Wide variation in education systems across the Autonomous Communities.
  - Extremely tough economic climate, with □1.8 billion (U$$2.4 billion) to be cut from the education budget in 2011.
  - Commercial market is very reliant on Escuela 2.0 rather than responding to market demand. This also has risks associated with it if the policy becomes under threat from cuts.
  - In higher education, legal restrictions require predominantly face-to-face teaching in classrooms settings. Any e-Learning and Mobile Education initiatives have to comply with this.

3 Education System

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Total public expenditure on education in Spain in 2010 was just under €54 billion (U$72 billion), the equivalent to 5.11% of GDP.[1] However, Spain has been severely affected by the global economic crisis and faces a €1.8 billion (U$2.8 billion) cut in the education budget for 2011.

The education system in Spain has undergone radical reforms and transformation in recent decades, having emerged from years of dictatorship in the 1970's. Efforts to modernise the system are still in evidence, especially regarding autonomy and accountability, especially in higher education.

Table: Education in Spain[2]

Phase	Age	Number of Students*	Expenditure	Types of Institution
Pre-School and Nursery	0-5	1,873,153	€4,576 per student (U$6,092)	■ Pre-school, non compulsory and free for all.
Primary	6-12	2,749,496	€4,870 per student (U$6,483)	■ Public schools. ■ Public concerted schools, funded by autonomous communities. ■ Private schools.
Compulsory Secondary (ESO)	13-16 17-18	1,786,106	€6,508 per student (U$8,664)	■ Public high schools. ■ Public concerted high schools funded by autonomous communities .
Upper Secondary		658,587	€9,354 per student (U$12,452)	■ Private high schools. ■ Upper secondary or baccalaureate, both technical or academic, not compulsory.
Vocational Education	16+	568.962		■ Upper grade vocational training schools.
Non-University Education	16+	7,632,961 (2009/10)		
Higher Education	18+	1,362,173 (2009/10)		■ Universities.

1 Ministry of Education: Education Statistics 2010/2011
2 For the academic year 2010-2011, Education Statistics, Ministry of Education: http://www.educacion.gob.es/mecd/estadisticas/educativas/dcce/Datos_Cifras_web.pdf

4 Schools

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Education Ecosystems – Spanish Schools

Government/Ministry
- Ministry for Education and Science
  - General organisation of the education system
  - Sets minimum requirements for schools and core curriculum
  - Regulation of academic and professional qualifications
  - Conducts 'high inspections'

State/Education Agencies
- *17 Autonomous Communities* - Administrative responsibility; schools creation, authorization and management; State regulations regarding syllabuses; staff management; educational inspection; supervision of textbooks and other materials; diagnostic assessment; subsidies to private schools
- Local Corporations- Provision of sites for building public schools; maintenance and refurbishment of Pre-primary, Primary and special education schools; planning extra-curricular and supplementary activities, monitoring compulsory schooling; creation of School Councils within their municipality

Suppliers
- Schools have financial autonomy to make spending decisions

State Schools
- 3,752 pre-schools
- 9,806 primary schools (+635 primary plus lower sec)
- 3,918 lower sec plus upper sec schools
- 1,412 schools with specialist curriculums (arts, sport, languages)

Private Schools
- 8,144 private schools
- 75 % are Publicly-financed private schools (concertados) receive state funds but must adhere curriculum and other conditions

Not exhaustive

Educators

Learners

Parents pay for meals, school transport, out-of-school activities, textbooks and teaching materials

Other Stakeholders

Advisory Bodies
- *State School Council* (*Consejo Escolar del Estado*) – responsible for social participation and includes parents representatives
- General Council for Vocational Training (Consejo General de la Formación Profesional)
- The Supreme Council for Artistic Education.
- The State Observatory for School Coexistence

Unions/Professional
- Federation of Teachers (Federación de Enseñanza)
- Fed. of Workers in Education

Regional Bodies
- Regional School Councils
- Regional Councils for Vocational Training,
- Supreme Councils for Artistic Education

Source: GSMA

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The main characteristics of the school system are:

- Decentralised model distributes the education responsibilities among the State, the Autonomous Communities, local administrations and schools. The 17 regions have real powers to shape education in their area often leading to marked differences in approach.
- Public schools are relatively autonomous in organisational, educational and financial matters, within the framework of regulations.
- Many private schools are run by religious orders.
- Ministry of Education establishes a minimum curriculum (65%), which all the Autonomous Communities must follow, but the latter develop the rest of the curriculum to address their preferences and local needs.
- Textbooks are selected by teachers, usually from a recommended list of authorised materials provided by the Autonomous Community. In all schools parents generally buy textbooks.
- No national or regional system of testing. The minimum core curriculum includes basic guidelines for teacher assessment.

4.1 Technology

While ICT policies vary in emphasis and depth across the Autonomous Communities, the integration of ICT in schools is by and large a reality at all levels. This is set to be enhanced by an ambitious nationwide ICT plan for schools, Escuela 2.0, first launched in 2009. This builds on existing achievements and aims to generalise the access to hardware and digital content in schools in order to pedagogically integrate ICT into school life. The political will to extend it to the whole country (with a couple of exceptions) is what makes this plan most remarkable.

In addition to Escuela 2.0, the Government has created a national repository of digital contents called Agrega, which aggregates content from each Autonomous Community.

Cuts in the education budget may raise questions over the sustainability of these ambitious polices, but we have so far found no clear evidence of this.

Table: Technology in Spanish Schools

Aspect	Description		
Expenditure	■ Expenditure on Escuela 2.0 was €200m on ICT equipment, broadband and services.		
Policy	■ Escuela 2.0 and Proyecto Agrega are ambitious Ministry of Education initiatives, coordinated at a national level in collaboration with the Autonomous Communities. ■ Institute of Educational Technology, within the MoE, responsible for the adoption of ICTs within classrooms .		
Procurement	■ Majority of ICT spend stems directly from autonomous communities to schools – for example, most provide central VLEs (usually custom made) to all schools in their region.		
Penetration		Primary schools	Secondary schools
	Students per computer	5.2	4.0
	% of school with internet	99.6%	99.7%
	% schools with broadband	81.6%	94.1%
	■ Schools are provided with regional service services to host websites		

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4.2 Mobile Education

A key lever within Escuela 2.0 is 1:1 devices for students - so far 500,000 devices have been distributed, and many teachers have been trained in how to effectively introduce ICT into classroom teaching and learning. Regions are focusing on different aspects, for instance: Extremadura has become known worldwide for its commitment to open software and its excellent rates of computers per pupils; Aragon is introducing tablet PCs and Interactive White Boards; and Catalonia is introducing netbooks in schools.

The wide differences in approach and implementation of Escuela 2.0 across regions are evident. Several regions have implemented State wide roll outs of mobile devices, and these have been merged with the Project Escuela 2.0 mentioned above. Some regions such as Madrid and Valencia are reticent about rolling small screen devices out due to concerns about eyestrain; others such as Aragon, Andalusia have already made great strides.

The wide disparities are particularly clear when the model of device ownership adopted within Escuela 2.0 is compared. Aragon, for instance, allows students to make use of laptops throughout the compulsory education stage, but with a commitment to return them when finished. Andalusia also adopts this model, but students would own them if they successfully complete their studies, whilst Catalonia has chosen co-payment (see case study below).

Part of the project includes the digitisation of teaching resources and it is expected that 80 public schools will be the first to use e-Books for the academic year 2010-2011. Of the total, 64 schools will work primarily with laptops both online and offline, using materials developed by publishers. The remaining 16 will focus on developing teaching materials in electronic form.[1]

4.3 Ownership of Mobile Devices

According to research conducted by the Nokia's Observatory of Trends in 2010, 100% of young people between the ages of 15 and 24 own a mobile phone, of which 68% own a smartphone, and 53% access the Internet from their mobile devices. From those, 36% go online using their phones at least once a week and 17% do so less regularly.[2]

Even young children have high levels of ownership with an estimated 43% of children between 6 and 11 years have a mobile phone.[3]

1 *Web 2.0 to School 2.0 in Spain*, J. Aguaded, A. Montilla, Á. Hernando, The Journal of Media Literacy, 2011
2 *Los jóvenes, los móviles y la tecnología*, Nokia Observatorio de Tendencias, , 2010
3 *Mobile Learning Support System for Vocational Education and Training*, Edited by D. Keegan and N. Mileva, 2010

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4.4 Case Studies

EDUCAT1X1 (Catalonia)

This was launched in parallel to the Escuela 2.0 project, but subsequently the two projects merged, and which gave the Catalonian project a significant increase in budget.

Case Study – EDUCAT1X1 (Catalonia)	
Aim	Implement the State-wide project Escuela 2.0 in the State of Catalonia.
Scale	500,000 students in total. Latest phase: 1,000 schools, 9,900 classrooms, 250,000 students, 45,000 teachers.
Description	■ Designed to be progressively rolled out to the whole educational community, by grade/level, starting the 1st and 2nd years of secondary school. ■ Devices bought (co-financed 50% by the family and 50% by public funds) and maintained by families with a maximum price of €300 (U$464). Grants available for low-income families. ■ Access to commercially available educational digital content is co-financed.
Partners	Department of Education of the Generalitat de Catalunya, Catalonian Foundation for Research and Innovation; private enterprises; large and small computer suppliers.
Funding/Business Model	■ Annual funding is €46 million ($71 million) in total, to cover costs for 60,000 new students per year: ■ Source: – €23m ($36m) - Department of Education of the Generalitat de Catalunya. – €16m ($25m) - Spanish Ministry of Education (contributing to 50% of the deployment costs, not including wide area telecommunications and other hidden costs). – €7m ($11m) from families, who pay half the cost of the pupils' PCs. ■ Estimated cost per student for the administration is €650 ($1,005) for the first year and €250 ($387) for the following; the cost to families is €180 ($278) for the first year.
Technologies	■ Laptop computers. ■ Unified WAN-LAN architecture for all schools. ■ Low-cost Internet connections for students at home. ■ Extensive use of digital textbooks from commercial publishers.
Impact on Learning	■ No objective evaluation has been conducted yet so impact assessments are not available.
Sustainability	Only implemented in 2009-2010.

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Pizarra Digital (Aragon)

Pizarra Digital was first implemented in 2003-2004 by the Community of Aragon, and again, has now been drawn into the Escuela 2.0 framework. This introduces tablet PCs and interactive whiteboards in its schools.

Case Study – Pizarra Digital (Aragon)	
Aim	■ Encourage the innovative processes in the educational context. ■ Achieve a high level of digital competence amongst students. ■ Bring the Information Society closer to the students' family environment.
Scale	131 centre, 714 teachers and 5,504 students.
Description	■ Provision of tablet PCs for individual use in classes at the third cycle of primary education (10 and 11 years old). ■ CSe complementa con un video proyector, banda ancha y redes inalámbricas.omplemented with a video projector, broadband and wireless networks. ■ Training activities for teachers.
Partners	Community of Aragon.
Funding	€15 million ($23million) for 5 years from 2005-2009.
Technologies	Tablet PCs and IWBs.
Impact on Learning	■ Evaluation showed that support from education community was achieved, as well as better learning environments and valorisation of teachers' professional development. ■ Most students and their families demand that the project is extended to the ESO (Secondary Education) stage.
Lessons Learned	■ Voluntary participation of schools was a driver of successful implementation, and it enabled a deeper involvement of teachers. ■ Technology support in schools is too limited in its focus and does not foster more innovative and dynamic uses. ■ Need to find ways of encouraging peer learning amongst teachers. ■ Some differences in the infrastructures of territories and some technical deficits that impacts on the overall utilisation of TPCs in each area.
Sustainability	Not clear.

5 Technical and Vocational Training

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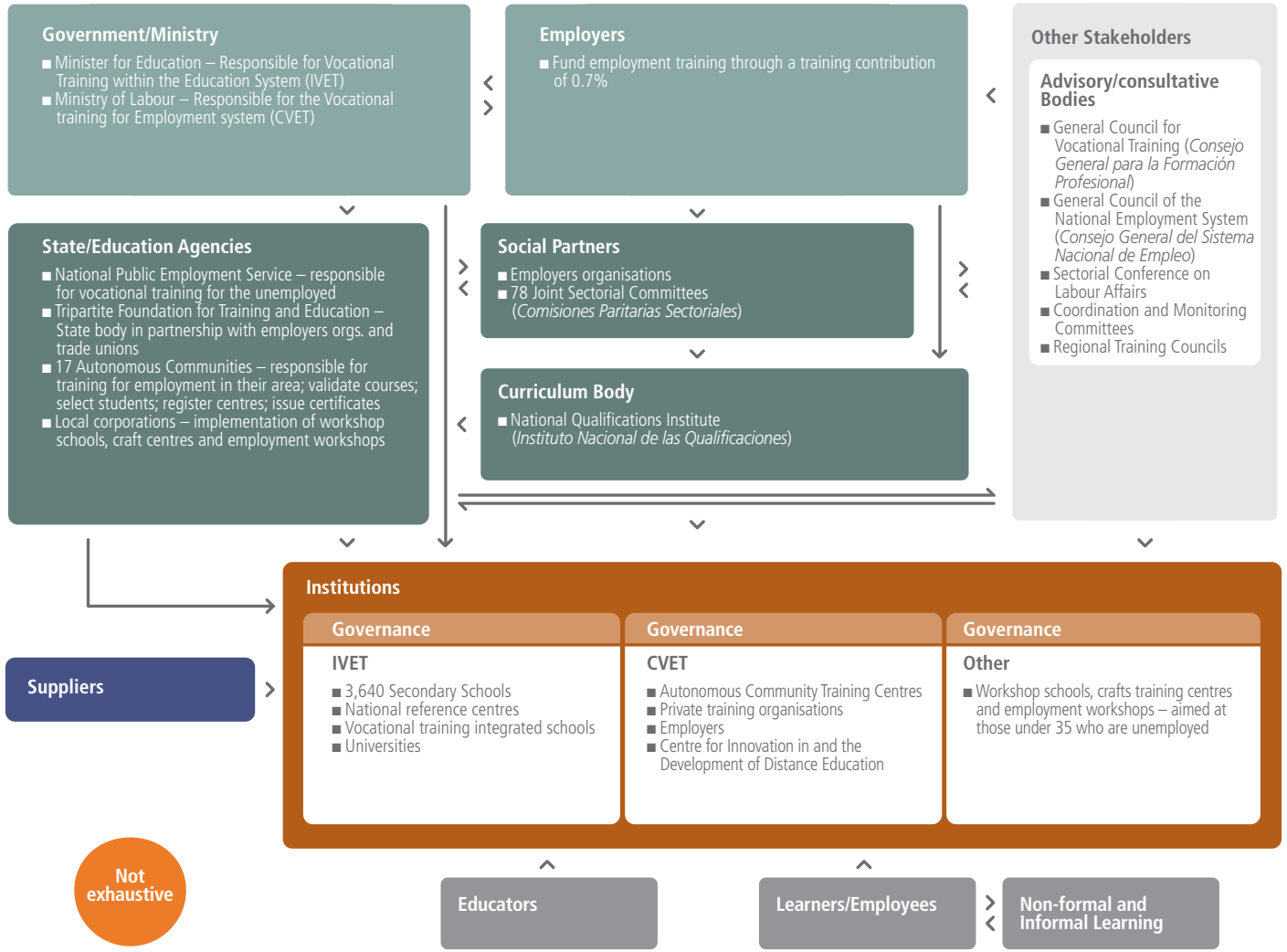
Education Ecosystems – Spanish Technical and Vocational Education



Source: GSMA

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Vocational training is essentially delivered via two systems:

- Initial Vocational Training (IVET) - delivered through the school and higher education systems: Usually lead to a qualification in the National Catalogue of Professional Qualifications which is based around 26 industry groups. This training includes work placements.
- Continuing Vocational Training for Adults (CVET) - part of the employment system, and covers both those unemployed and those in employment receiving further training.

Types of CVET are:

- Basic education – literacy and basic education.
- Adult secondary education - for those who did not gain qualifications in school.
- Bachillerato for Adults – for adults wishing to obtain a high school Bachillerato.

The main characteristics of the sector are:

- Policy focus on promoting training and education and lifelong learning, including recognition to learning acquired through work experience and the development of the National Qualifications and Vocational Training System.
- Training is provided in a wide range of institutions/centres, ranging from general high schools and specific training colleges, to private providers specialising in specific areas.
- CVET is publically financed and free to users. It has grown significantly in recent years - 10.4% (vs. 9.5% average for Europe) of adults' participated lifelong learning 2008.[1]
- Spanish employees received an average of 13 hours training in 2010. Classroom-based teaching is the dominant method (82%), with 33% incorporating mixed/blended learning.[2]
- Curricula followed are set by a combination of central government, the individual Autonomous Communities and by the school/training providers themselves. This means that each school/department has, to a certain degree, the liberty to influence local education with subjects that are relevant according to local conditions and priorities.

5.1 Technology

As described above the majority of initial vocational training is delivered in schools and therefore the use of technology has been covered in the previous section. There is a growing awareness of the importance of modern ICT-equipment for teachers and also for students in this segment, especially at private schools. The status of technology in vocational schools varies considerably. It is estimated that in private schools there is one computer per 1-3 student compared to public schools where the ratio can be up to one to five. Although most vocational centres are connected to the internet there is insufficient bandwidth to deliver e or Mobile Education.[3]

In terms of using ICT in delivering vocational training to adults, most emphasis seems to be on upgrading infrastructure and creating distance learning systems.

One example of the use of technology to deliver learning is the project Aula Mentor, a system of distance learning delivered over the Internet which is developed by the Instituto de Tecnologías Educativas, (Institute for Education Technologies) of the Ministry of Education, in cooperation with several institutions. This is a virtual educational platform, which includes various distance training courses and professional modules at both the intermediate and advanced levels. This initiative provides greater flexibility in access to training, so that students can complete a training course and obtain the corresponding diploma.

5.2 Mobile Education

The use of mobile technologies in TVET in Spain is still embryonic, with basic infrastructure needs, such as connectivity and hardware, being the main barrier.

There are small pockets/examples of institutions piloting Mobile Education. One example is IES Escola del Treball. This vocational school has experimented with using mobile phones to increase the communication between trainer and apprentices, who often split between their places of training and workplace. They found that incorporating mobile phones into their system increased efficiency, improved motivation and communication and has had an impact on improving the technical infrastructure of the school.

1 *CEDEFOP – Spain – VET in Europe*, Country Report 2010
2 *Cegos European Survey of Learning Trends 2011*, May 2011 Cegos - http://www.slideshare.net/clives/cegos-2011-learning-trends-survey-draft-final-may-11
3 *Distance Learning for Apprentices, The influence of education system on mobile learning*, 2009 Escola del Treball, Barcelona, Spain

6 Higher Education

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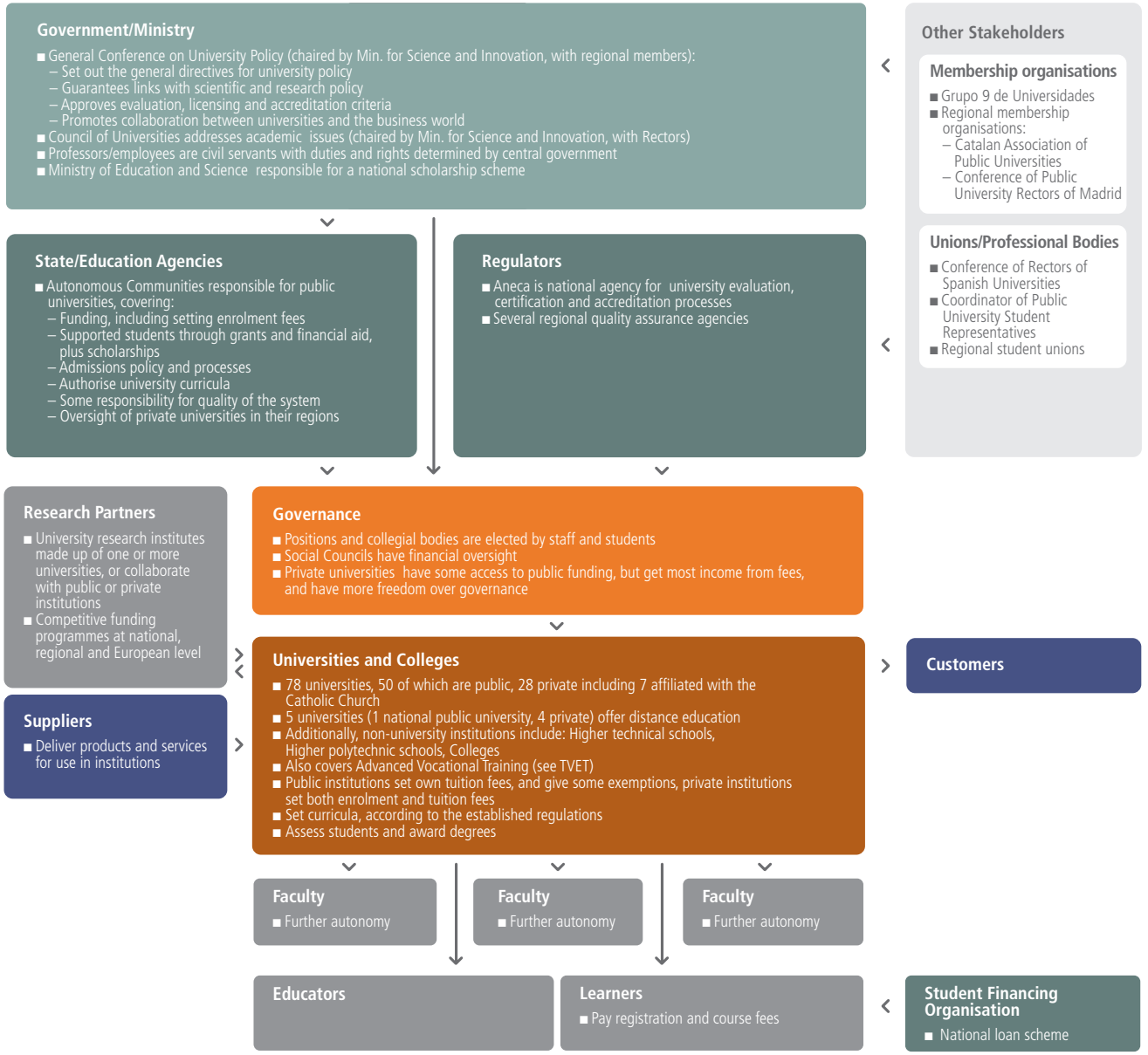
Spain has one of the oldest higher education traditions in the world, traceable back to 1218, but in recent decades, it has fallen behind other countries and is working hard to modernise the system.

Education Ecosystems – Spanish Higher Education



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The characteristics of the higher education system in Spain include:

- Rapid expansion, with a number of institutions doubling over the last twenty years.
- Responsibilities dispersed across central, regional and institutional levels.
- Increasing levels of autonomy at regional and institutional level as historically many restrictions regulated centrally level. Institutions now have complete freedom to set their own curricula, but this was heavily circumscribed until this change in 2008.
- Differences in funding, organisation and performance across regions, with some regions performing at a higher level than others.
- Relatively traditional approach to teaching and learning, with active teachers and more passive learners.
- Transition to meet the requirements and degree structure set out by the Bologna requirements has led to a lot of change in the system – completion expected in 2010-11.
- Many calls for reform in the university governance in Spain, including from OECD.
- University 2015 Strategy being implemented by Government, the Autonomous Communities and the universities. Aims to update the university system, address social issues and promote excellence, internationalisation and knowledge and innovation.
- Recent scandal about widespread corruption in Spanish universities, triggered by the publication of a book, Corruption in the University, which describes the relationship between Spanish universities and local politics and positions this as a major factor in the "mediocrity" of the country's higher education institutions.
- Sustained effort in the last two decades to increase higher education spending, but current economic crisis is affecting public spending at all levels. University budgets are nonetheless expected to increase by 2% in 2011 and 4.7% annually in 2012-14 (Catalonia example).

Table: Technology in the Spanish Higher Education Sector

Aspect	Main Points			
Expenditure	■ ICT expenditure is, on average, 3.24% of university budgets.[1] ■ Average ICT budget per student was €412 ($637) in 2010, which is a reduction on 2009 but one in part due to expanding numbers of students. Implies ~ €641 million ($991 million) overall expenditure.			
Policy	■ As part of Plan Avanza, the national digital strategy, all public universities have free WIFI access as a result of Campus Online programme. ■ Limited education policy focus – relatively peripheral part of University 2015 Strategy.			
Procurement	■ Institution-led, but autonomy and functions to develop and deliver ICT strategies are new for Spanish universities.			
Penetration[1]		**2008**	**2009**	**2010**
	No. of computers per student.	0.55	0.63	0.78
	No. of students for each wifi connection.	7.46	n/a	n/a
	Classrooms with internet access point.	85%	n/a	n/a
	Classrooms with wifi coverage.	81%	86%	86%
	Digital whiteboards installed in classrooms.	6%	14%	16%
	Subjects supported by virtual platforms.	52%	n/a	n/a
	Students equipment with internet access.	54%	n/a	n/a
	Institutions carried out online teaching initiatives.	78%	81%	83%
	Use of Virtual Learning Environments for teaching and learning.	98%	n/a	n/a
	Institutional teaching plan implemented or in development.	97%	n/a	n/a
	Student use of online teaching platform.	80%	87%	90%
	Teachers use of institutional virtual learning platform.	58%	67%	73%

1 *Las TIC en el Sistema Universitario Español* – Report published by the ICT Sector of Spanish University Rectors' Conference, 2010 - http://www.crue.org/UNIVERSITIC

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6.1 Technology

Importantly, legal restrictions are in place that require the maintenance of a significant percentage of the teaching and learning activities in the traditional classroom in face to face sessions (with only a very few exceptions), and as a consequence, e-Learning (and Mobile Education) tools need to be carefully integrated with the more traditional approach of face to face sessions in the classroom.

Nonetheless, the use of the new technologies in university classrooms has become a more common practice in Spanish universities.
For example:

- Digital screens are in use in many classrooms and ICT-based presentations are widely employed.
- Teachers are supported in administrative tasks – including managing and evaluating work, distribution of grades, schedules, deadlines etc. – and exchange of information with students (e.g. virtual classes, web pages, online resources, etc.)
- Some teachers are beginning to design and develop online activities.
- Most institutions have made significant investments in Learning Management Systems:
  - 42% have purchased these from commercial software vendors
  - 38% have developed proprietary software internally
  - 32% have used open source software, mostly Moodle platform.[1]
- The use of virtual technologies is spreading in teaching. Almost all universities now have an institutional platform for virtual teaching and a large proportion have strategic plans in place to develop this further. Just over half of teachers use the platform, with a much higher percentage for students – 82%. Almost all indicators show an upward trend which we would expect to have continued or consolidated since 2008.

However, whilst there are lots of uses of ICT in place, the signs show that more progress is required to fully embed ICT in teaching and learning and ultimately transform the experience of learning. Progress is required in areas like: establishing incentives for teaching; developing training plans; developing standards and quality criteria for publishing courses and other materials; and improving collaboration among universities to share best experiences, information and knowledge.

Almost all of the Spanish universities (90%) offer distance learning through Virtual Campuses, including 3 that only offer distance learning. Most (66) have their own Virtual Campus, with 7 belonging to a group or network of universities. One of the most technically advanced is the Universitat Oberta de Catalunya (UOC), which has more than fifty thousand students and two thousand teachers, who teach and learn through a virtual learning environment (VLE). This VLE has virtual classrooms with different collaborative skills and applications in order to do the courses (see further detail below).

6.2 Mobile Education

The level of Mobile Education services and applications offered by Spanish universities is limited compared with other countries, despite similar levels of demand from students and sustained high growth in the percentage of classrooms with wireless connection (now over 85%).

It seems as though distance education; with one institution in particular – Universitat Oberta de Catalunya (UOC) - is blazing a trail for Mobile Education in the higher education sector. The Office of Learning Technologies at UOC is very actively exploring and promoting e-Learning and Mobile Education solutions – the latter includes mobile course updates, a geolocation tool for students, and a mobile portal. They are also developing a 'Learning Apps' portal that will be a store for applications, content and educational services. It will provide a space where teachers and educational institutions can easily find these tools and build their own e-Learning environment in the cloud (on the Amazon cloud computing infrastructure). The project began in late 2010 and will launch in 2012.

1 *Virtual Learning Environments in Spanish Traditional Universities*, Urcola Carrera, Leire and Artola Altuzarra, Amaia, World Academy of Science, Engineering and Technology 66 2010 - http://www.waset.org/journals/waset/v66/v66-148.pdf

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6.3 Case Study

iUOC: Enhanced Mobile Learning at the UOC

Another high profile UOC initiative is mobile campus app, in collaboration with Orange Spain, which aims to make the UOC's virtual campus, My UOC, more interactive and mobile.

Case Study – iUOC: Enhanced Mobile Learning at the UOC	
Aim	■ Study the learning possibilities offered by the iPad or other mobile devices.
Scale	■ Initial trial with 45 students and lecturers.
Description	■ Developed a native app for the iPad. ■ Used RSS technology to provide a connection to the communication. ■ Spaces of students and lecturers in the virtual campus. ■ UOC's educational materials were adapted for the iPad. ■ Students have the ability to check their mail, diary, educational materials, classrooms and the opinions of other students.
Partners	■ UOC. ■ Orange Spain.
Funding/Business Model	■ Funded from the regular UOC budget. ■ Orange awarded €23,453 ($36,255).
Technologies	■ iPads with 3G connections.
Impact on Learning	■ Did not directly impact learning.
Lessons Learned	■ Students and teachers evaluated the iPad positively as a means of obtaining information, as a communication tool and as an interactive support for learning. ■ iUOC application is user friendly and intuitive. ■ iPad with 3G connection is a good tool for education; apart from the iUOC, different applications help students and teachers in their daily tasks. ■ Problems with iPads are: not a good tool for writing and creating content; and students and teachers don't know the full pedagogical and technical possibilities of iPad devices. ■ 3G connection is highly valued.
Sustainability	■ Next step will be to provide the 85,000 members of the UOC community with the iUOC native iPad application, as well as providing tutors and lecturers with a user manual on other educational applications that have arisen out of this project.

7 Market for Mobile Education

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The Spanish appetite for smartphones seems strong, and surpasses all countries in terms of smartphone adoption, reaching 37.6% penetration in 2010 (up 10.3% on 2009).[1]

Within schools most Mobile Education initiatives have been brought under the Escuela 2.0 umbrella, and that does look to provide some impetus. The focus here however, seems to be around access to devices rather than developing content or new teaching and learning methods – no doubt the emphasis on face-to-face, classroom based teaching is a limiting factor here. In higher education, there is little evidence of a focus on Mobile Education, with the exception of one stand-out institution, the Universitat Oberta de Catalunya.

The national digital strategy, Plan Avanzas, currently in its second phase (2011-2015), includes the objective of modernising the education and training model through the use of ICT, but so far there do not appear to be any specific links to the development of Mobile Education.

7.1 Mobile Education Ecosystem

Most commercial activity is from publishers that have partnered with the regional governments to provide materials for their schools, driven by the Escuela 2.0 initiative. Against this backdrop, publishers and other content providers are developing and increasingly commercialising digital content, especially PRISA, a large Spanish publishing company:

- **PRISA** – has a strong digital arm and is producing digital products aimed at the education market. It has embarked on an ambitious strategy of content distribution, offering products and services adapted to users' consumer habits through mobile phone devices, iPads, e-Books and PSP games consoles. Through its Santillana division, PRISA has been heavily involved in the Catalonian region's Escuela 2.0 project, and has recently been awarded recognition by the Ministry of Education for its work in this area. Santillana has been instrumental in the development of the initiative by devising the Llibreweb, which delivers educational materials through interactive content, online tools and innovative monitoring and evaluation systems.
- **educaLine** - a publishing company that specialises specifically on e-Learning and is one of the main providers of digital content for the Escuela 2.0 initiative. Their digital catalogue includes more than 30,000 high quality multimedia resources covering 23 subjects, fully editable for the teachers to adapt to any teaching or learning pathway.
- **Algaida** - the Andalusian brand of Hachette Livre in Spain, includes a multimedia digital tool for pupils and a support guide for teachers in several of its natural sciences textbooks.

There is great potential for digital content in Spanish, not just within Spain but also for the huge market of Spanish speakers around the world. One estimate values the digital content industry comprised an impressive □9.2 million ($14.2 million) in 2009 and it is growing rapidly.[2]

One of the other major players in the market is Vodafone who have an agreement with the Ministry of Education to partner for the *"Internet for Your Homework"* project, which is part of the Escuela 2.0 national initiative and aims to universalise broadband in schools. The project also provides a subsidised mobile internet access rate for schoolchildren at home from 6pm to 9pm for €9 a month. The service includes a filter to prevent access to inappropriate content.

1 *Smartphone Adoption increased across US and Europe*, comScore, Feb 2011
2 *Los Contenidos Digitales en España*, Asociacion de Empresas de Electronica, Tecnologias de la Informacion y Telecomunicaciones de Espana, 2009 www.elpais.com/elpaismedia/.../20100506elpepucul_2_Pes_PDF.pdf

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8.1 Exchange Rates

In this report, all values are given in national currencies, with corresponding figures in US$. The exchange rates used are sourced from the OECD and are as follows:

Table: Exchange Rates – National Currency Per US$

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
□	1.09	1.12	1.06	0.89	0.80	0.80	0.80	0.73	0.68	0.72	0.75	0.72	0.72
£	0.66	0.69	0.67	0.61	0.55	0.55	0.54	0.50	0.55	0.64	0.65	0.63	0.63
Yen	107.83	121.48	125.25	115.94	108.15	110.10	116.35	117.76	103.39	93.57	87.51	81.39	81.39

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