e-SKILLS IN EUROPE

GREECE

COUNTRY REPORT

JANUARY 2014

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1 Overview

After the launch of the Communication on e-skills for the 21st century by the European Commission in 2007, Greece initiated certain measures regarding actions for digital literacy and e-skills such as the Digital Convergence Project and certain acts such as the Lifelong Learning Act of 2008. A National Action Plan commenced for the implementation of the Lisbon Strategy objectives regarding different activities and practices on e-skills, digital literacy, lifelong learning, and continuous professional development on new technologies, e-learning e-safety e-government and electronic literacy.

E-Skills and Digital Literacy are included in the political agenda of Greece and a growing interest as well as the need for these is acknowledged. Different strategies and policies, adopting, selecting and implementing ICT activities requiring and promoting e-skills and digital literacy exist and have been described above. Different stakeholders took and take part, such as the public sector, through the training of adults, the local authorities as well as educational organisations and public training centres including universities. Certain government bodies such as the adult learning centres (the particular bodies no longer operates, a new organisation is now formed and functions with the specific purpose as discussed previously called INEDIVIM) and the general secretariat for youth and other specific initiatives cultivate the field for future successful strategies and the promotion of effective training projects in the field.

Nevertheless, other projects remain on hold such as the initiation and development of a digital national register for the trainers of adults and the trainers of the trainers until the 31/12/2010. The specific project was undertaken by the new body of accreditation and vocational guidance named EOPPEP. EOPPEP is the National Organisation for the Certification of Qualifications and Vocational Guidance, an all-encompassing statutory body investing on better quality and more efficient & reliable lifelong learning services in Greece. EOPPEP operates under the supervision of the Minister of Education & Religious Affairs and is seated in Athens. It has derived from the amalgamation of three national bodies, all under the supervision of the same Ministry: the National Centre for the Accreditation of Lifelong Learning Providers (EKEPIS), the National Organisation for the Certification of Qualifications (EOPP) & the National Centre for Vocational Guidance (EKEP).

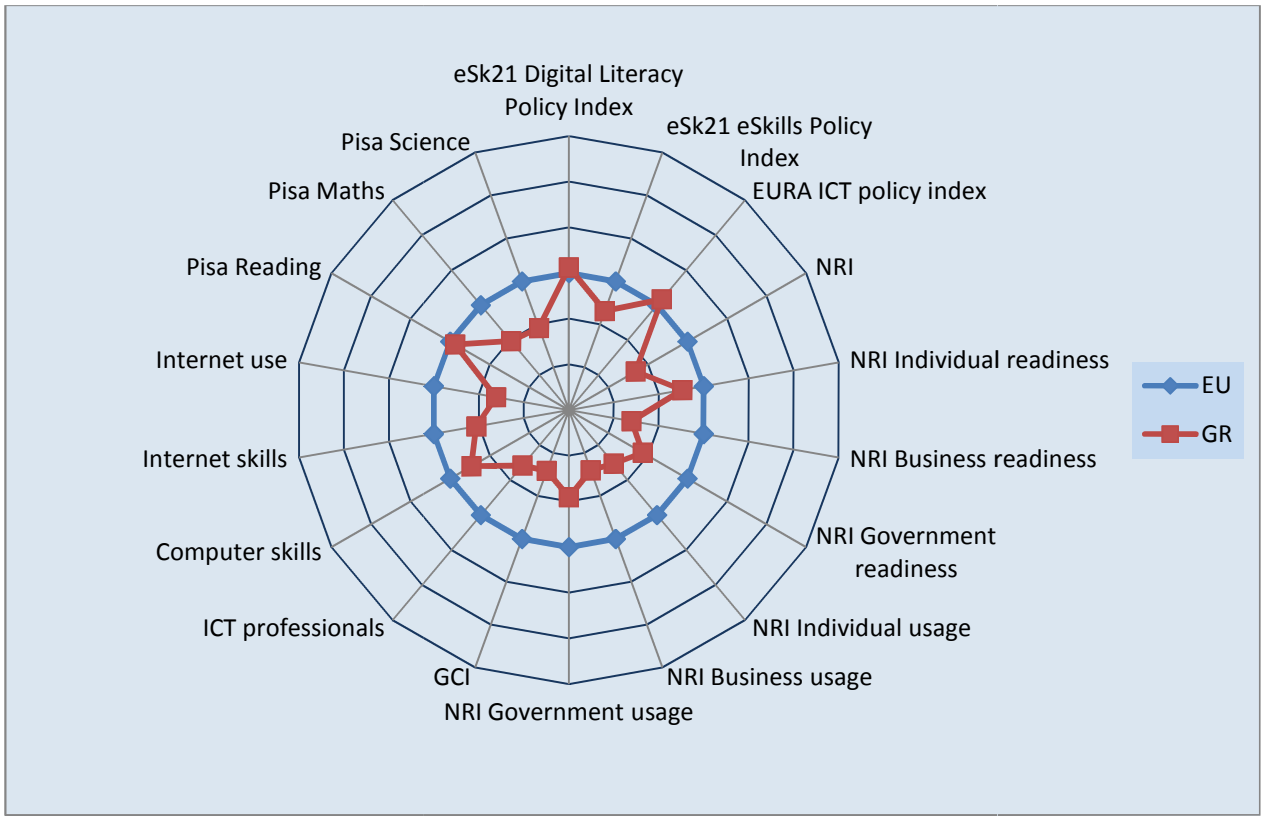
The newly established national authority, the National Organisation for the Certification of Qualifications and Vocational Guidance (EOPPEP), corresponds to the pressing need of creating and maintaining a holistic and interrelated policy framework for the development of lifelong learning and certification of qualifications in Greece, linking with the open market and responding to the needs of the citizens, a central issue in EU policy. However the specific body administrates only separate registries such as the adult educators and evaluators and the national registry action is still on hold.

Also there are existing running training programmes organised and supported by the Greek manpower employment organisation for the employees of a number of private and public organisations such as the Greek training organisation and the Greek port employees' organisation on ICT and business innovation.

In general there is rising concern among IT professionals about the increase in unemployment. Although there were small percentages of unemployment in the sector in recent years and an increase in demand for IT professionals from 2000 and onwards, since the start of the economic crisis and specifically since 2008 the IT sector companies are facing huge financial difficulties due to lack of funds. This resulted in the rise of unemployment of IT professionals and the ever growing concern in the field. There is at the moment a decrease of demand in the field in Greece and a search for employment elsewhere in Europe and globally.

2 Indicators on innovation, competitiveness and ICT skills

Greece						
	Score 2009/2010	Rank 2009/2010	Score 2011/2012	EU27 Rank 2011/2012	Change (Rank)	Comment
eSkills21 study: 'e-skills' index 2010	**1.5**	**14**				Max.: 5.0
eSkills21 study: 'Digital literacy' index 2010	**3**	**10**				Max.: 9.0
EuRA e-skills index	**3.4**	**13**				Max.: 5.0
ICT practitioners in % of total employment 2012			**1.63%**	**26**		EU average: 3.43%
Digital literacy skills of the population 2009/11:						
• Individuals with high level of computer skills	**13%**	**25**	**24%**	**20**	↓	EU average: 28.52%
• Individuals with high level of Internet skills	**4%**	**24**	**8%**	**23**	↓	EU average: 13.67%
• Individuals using the Internet (last three months)	**42%**	**25**	**52%**	**23**	↓	EU average: 71.33%
Global Competitiveness Index (GCI) 2010/12	**4.0**	**26**	**3.92**	**27**	↑	Max.: 5.61 EU median: 4.52
Networked Readiness Index (NRI) 2010/12	**4.0**	**24**	**3.83**	**24**	→	Max.: 5.6. EU median: 4.5
• Individual readiness	**5.49**	**25**	**4.86**	**21**	↓	
• Business readiness	**4.27**	**26**	**3.63**	**26**	→	
• Government readiness	**3.97**	**23**	**3.54**	**23**	→	
• Individual usage	**2.51**	**27**	**4.11**	**26**	↓	
• Business usage	**4.28**	**25**	**2.81**	**27**	↑	
• Government usage	**3.97**	**23**	**3.42**	**22**	↓	
PISA scores (2009) in:						
• Mathematics	**466**	**23**				EU median: 493
• Science	**470**	**23**				EU median: 498
• Reading	**483**	**16**				EU median: 489


eSk21 Digital Literacy Policy Index
eSk21 eSkills Policy Index
EURA ICT policy index
NRI
NRI Individual readiness
NRI Business readiness
NRI Government readiness
NRI Individual usage
NRI Business usage
NRI Government usage
GCI
ICT professionals
Computer skills
Internet skills
Internet use
Pisa Reading
Pisa Maths
Pisa Science
EU
GR

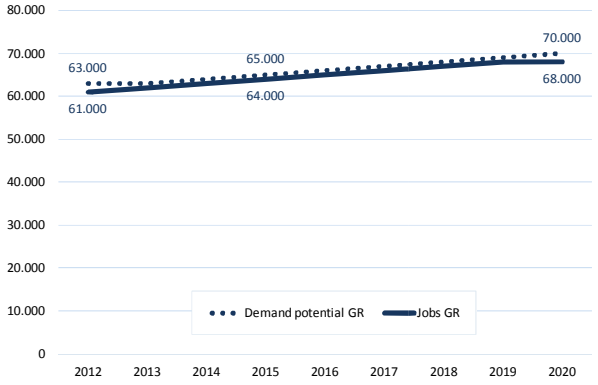
3 E-skills demand and supply forecasts 2012 – 2015 - 2020

Greece			
	GR	Rank EU27	EU27
ICT practitioner workforce 2012	61,000	20	7,403,000
ICT practitioner workforce 2012 as percent of total workforce	1.6%	26	3.4%
Assumed excess demand 2012	1,400	19	274,000
Forecast excess demand 2015	1,300	18	509,000
Forecast excess demand 2020	1,800	18	913,000
Forecast ICT practitioner jobs 2015	64,000	20	7,503,000
Forecast ICT practitioner jobs 2020	68,000	20	7,950,000
Workers 2012 - Management, business architecture and analysis level	12,000	16	1,477,000
... as percent of total workforce	0.3%	21	0.7%
Workers 2012 - ICT practitioners, professional level	26,000	18	3,393,000
... as percent of total workforce	0.7%	25	1.6%
Workers 2012 - ICT practitioners, technician and associate level	24,000	19	2,532,000
... as percent of total workforce	0.6%	24	1.2%
Growth core ICT workforce 2001-2010	9.5%	1	3.0%
Growth core ICT workforce 2008-2010	13.9%	1	2.6%
Growth core ICT workforce 2011-2012	4.4%	16	3.9%
Growth broad ICT workforce 2011-2012	-1.5%	21	1.8%
ISCED 5A/B first degree graduates in Computer Science, 2011	2,324	9	113,000
... graduates per 1000 population aged 20-24	3.6	13	3.6
... graduates 2011 as percent of 2006 (= peak EU)	115%	9	88%
Vocational training graduates in Computer Science, 2011	1,246	6	67,000

Sources and notes: see annex.

ICT workforce: Demand and Jobs in Greece 2012-2020

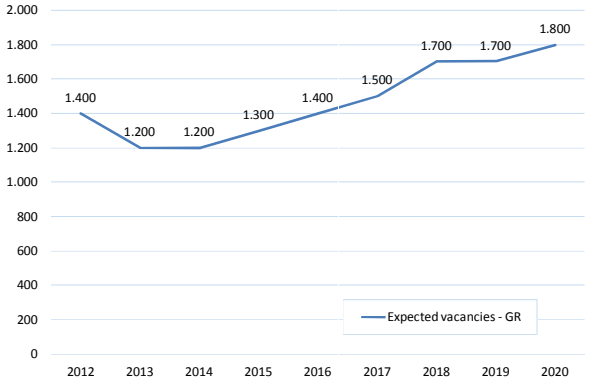
(Main Forecast Scenario)



Source: empirica 2013

e-Skills shortage: Potential vacancies in Greece 2012-2020

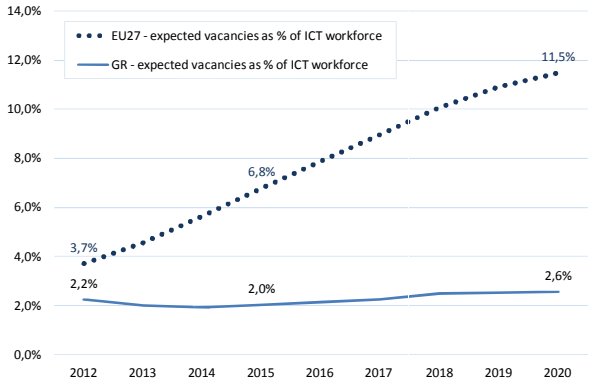
(Main Forecast Scenario)



Source: empirica 2013

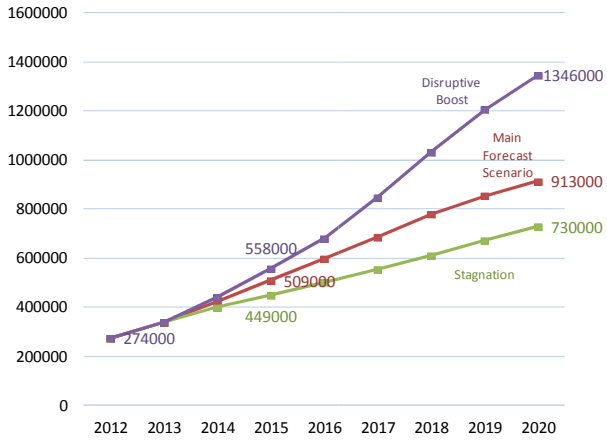
Potential vacancies as percent of ICT workforce Greece 2012-2020

(Main Forecast Scenario)



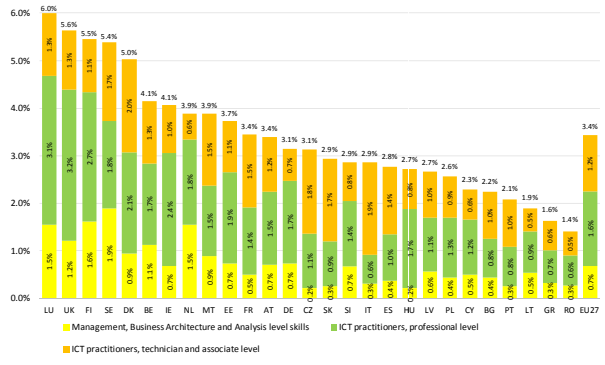
Source: empirica 2013

Potential vacancies in Europe (EU27) by scenario 2012-2020



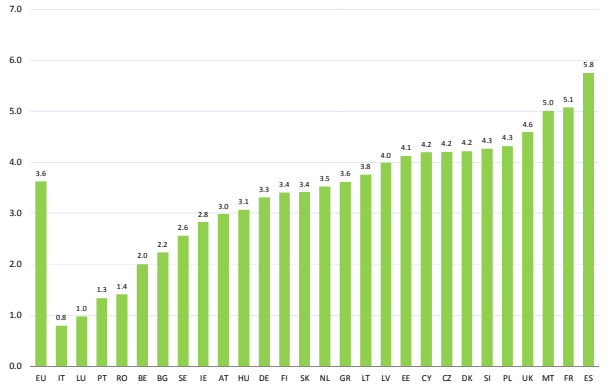
Source: empirica 2013

ICT practitioner workforce as percent of total workforce in EU Member States in 2012



Source: empirica 2013

First degree graduates in Computer Science (ISCED 5A/B) per 1000 population aged 20-24, 2011



Source: empirica 2013

4 Policy and major stakeholders initiatives

After the launch of the Communication on e-skills for the 21st century by the European Commission in 2007, Greece initiated certain measures regarding actions for digital literacy and e-skills such as the **Digital Convergence Project** and certain acts such as the **Lifelong Learning Act** of 2008. A **National Action Plan** commenced for the implementation of the Lisbon Strategy objectives regarding different activities and practices on e-skills, digital literacy, lifelong learning, and continuous professional development on new technologies, e-learning e-safety e-government and electronic literacy. In detail the projects are as follows:

Training of teachers in ICT pedagogy: The Greek Ministry of Education & Religious Affairs, Lifelong Learning and Religion (MNELR) and the Pedagogic Institute of Greece, (PI) together with the Academic Institute of Research and Technology in 2008 launched a nationwide project of INSET to meet the increasing demand for applying ICT pedagogy in education. The project started in May 2008 and is ongoing, and focuses on in-service training of Greek primary and secondary education teachers in ICT-applications for teaching. The scheme comprises training in ICT pedagogy and practical application in classroom teaching and self-directed learning. The target group is made up of the majority of Greek educators, i.e. 78,000 teachers at both primary and secondary level. Under the framework of the initiative certification of basic (A- level) and advanced (B- level) ICT skills is provided. Since 2008 there have been a number of changes regarding the policy. The Pedagogical Institute of Greece (PI) has been replaced by the Institute of Educational Policy (IEP). This caused a seven-month delay in the initiation of the 4th period of the training project, which was initially planned to start in September 2012.

Basic ICT skills training of citizens: Another lifelong learning initiative of the Greek government was the HERON project that is training adults in basic computer applications such as MS Word, Excel, Internet and E-mail. The project aimed to train 76,800 adults in Greece through the creation of 4,960 training centres in the period from 2008-2011. The project is completed and not running during the present days. Although there was an initiative to continue the training of adult-citizens in basic ICT skills through the introduction of the second part of the training project HERON-2 , the project ended in 2011. A change in the supervising and administrative bodies is also present here. The relevant administrative and regulatory body of the project, IDEKE, (Institute for lifelong and adult learning) was discontinued and connected with the Institute of Youth, (IFY). The new body is named Institute of Youth and Lifelong Learning, INEDIVIM and at this moment is organising the registry of the relevant trainers for the new training projects to take place. If you visit the web page you will find all the necessary information for the accreditation of the trainers in each geographic of Greece and the constant additions and changes in the registry. The training sessions will probably start in September with the initiation of the new academic year.

Training of Public Servants on issues and applications with ICT: The Interbalkan Institute, since June 2009, offers training of 50 hours on new technologies for public servants across six geographic regions of Greece on issues relating to electronic government, basic computer skills, security of networks, advanced computer skills and specialist computer applications. The specific training body continues to run and offers a variety of courses to public servants. One of the recent and innovative ones was the training in e-learning platforms for 126 hours started in October 2012 as well as educational management for 182 hours.

'**The New School**' project started an educational initiative for the educational reform and the digital school promoting ICT pedagogy implementation, curriculum and assessment reform, in school and in class digital infrastructure regarding the use of networked computers and relevant quality educational software as well as ongoing in service training and continuous professional development for the teachers on the effective integration of ICT pedagogy in classroom teaching and learning. The relevant act was submitted to the Greek parliament on the 26th of April 2010. In a

related initiative, the Greek Ministry of Education & Religious Affairs recently established the "Certification of knowledge in ICT-skills for all students in 3rd grade of High School" scheme.

Through the specific initiative there was also a national training project named **MEIZON**. The main aim of the project was to train teachers in the innovative teaching practices, such as group activities, use of ICT in the classroom and use of art and music in everyday lessons. The project ran for only one period during the previous academic year and for 200 hours, 54 at the training centers and 146 through an e-learning platform. However since the discontinuation of the Pedagogic Institute the project was terminated unexpectedly and its future remains to be seen. Problems of payment and administration are still present.

The **Centre for the Greek Language (CGL)** has undertaken to develop a variety of ICT initiatives in both primary and secondary education, such as the following: new Curricula for language subjects (ancient and modern Greek language and literature) which takes into account both Greek and international experience in terms of ICT use; studies/reports on the creative use of digital media in education and on the parameters for the design, development, implementation and evaluation of educational scenarios / lesson plans for an effective ICT pedagogy; educational research aiming to shed light on both teaching practices and youth digital literacy practices (the resulting data will be utilised in teacher training sessions); teaching and learning digital resources (such as corpora, concordances, databases, games); development and evaluation of educational scenarios/lesson plans which incorporate new technologies by teachers, and online communities of practice for educators. CGL started a project relating to the Greek language teaching and the implementation of new technologies as well as new literacies such as critique, effective communication and student collaboration and research initiatives through the design, creation and implementation of educational scenarios regarding these issues. The project is now in its second period, started in September 2012 and will be completed in late August 2013. There is an online community where teachers-creators of the educational scenarios exchange ideas and the e-moderators coordinate and correct the relevant files before final submission.

The **Digital Convergence Initiative** and **Information Society Monitoring Scheme**: Through the information society initiatives 170 different projects have been started such as digital health, e-energy, e-government, digital civilization and others with a budget of € 906.16 million. For the programming period 2007-2013, the "Digital Convergence" with a total budget of € 2 billion, aims to develop the effective and sustainable exploitation of ICT in the Greek economy. Targets of Digital Greece in 2013 include: digital supporting knowledge; digital consumer; digital protection of the natural environment; a digital security; support for digital work; support the digital quality of life; digital support and social and economic integration and participation; support for digital openness and specialized technological activities in local-regional level. Broadband convergence by expanding the broadband infrastructure to cover at least of 95% of the population by no later than 2013 is a further target of the Digital Greece horizon. Other targets include: introduction on new technologies in second level education; funding more than 20,000 businesses in order to improve their productivity; funding and operation of 10 major hubs for digital services through public sector to business; at least 300,000 people will directly benefit subsidies by the Digital Strategy for equipment and communications technology.

Initiatives for collaboration between private sector companies in designing and operation of training courses for employees on ICT skills include the agreement between **Oteacademy**, a private ICT training company, and **Oktabit**, a company in the computer distribution business OTEAcademy. The agreement is over provision of highly specialised training to ICT practitioners among the clients and collaborators of Oktabit. Training reaches the level of certification by independent organisations: Internet and Computing Core Certification (IC3); Microsoft Office Specialist (MOS); Computing Technology Industry Association (CompTIA Network +).

Finally, **e-leadership and digital entrepreneurship**, while not on the policy agenda yet, have started to be addressed by a number of stakeholder initiatives. For example, the **Hellenic Professionals Informatics Society** (HePIS), a not-for-profit association aiming to connect all ICT Professionals in Greece and represent the interests of both professionals and scientists in the field of ICT, has become a major player in the country's e-skills domain. HePIS set up **GetBusy** in November 2012. This is a joint effort of HePIS in partnership with Microsoft Hellas and PEOPLECERT (a provider of professional certifications), aiming to motivate young people to improve their e-skills and thus their employability, increase their entrepreneurial skills and learn about new technologies. See description in the next section.

Industry initiatives of relevance to the topic include the launch of the **Microsoft Innovation Centre** in Greece, offering a field for the cultivation of innovative ideas, development of e-skills through training and promotion and of partnerships between different stakeholders such as the academia as well as the technology clusters. Actions include: Promotion of digital literacy among teachers and pupils such as training seminars; Encourage innovation and the emergence of good practices by teachers and pupils; Establishment of a relationship in supporting and encouraging effective use of ICT in classroom activities. In addition, certain initiatives are promoted by the **Greek Computer Society (EPY)** offering training and support on relevant activities in the field through conferences, training meetings and collaboration activities between its members.

Also worth mentioning is **e-nnovation**, a multi-stakholder initiative that, in the middle of the financial crisis, achiebed remarkable results in terms of boosting entrepreneurial activity in the digital domain (ICT start-ups).

Summary Assessment of Greek e-Skills Activities: ●◖

Greek policies concentrate mainly on digital literacy, and no e-Skills policies apart from promotion/ awareness raising measures were reported.

Summary Assessment of Greek Digital Literacy Activities: ●●●

Greek Digital Literacy Activities include training measures of the workforce and IT promotion as well as measures targeted towards the education system. GetBusy is a good example of a multi-stake-holder partnership for motivating young people to improve their e-skills and employability.

Summary Assessment of Greek e-Leadership & Digital Entrepreneurship Activities: ●◖

e-Leadership skills and digital entrepreneurship have not yet entered the policy agenda. Industry-led initiatives such as the Microsoft Innovation Centre have started to provide training in the area, however. The GetBusy initiative represents a promising approach towards teaching entrepreneurial skills to young Greeks.

Like in the precursor study[1] the assessment of the information gathered resulted in two activity indices, one for digital literacy and one for e-skills computed for each country. These were computed based on data from 2009 and 2013. The e-leadership skills activity index was computed only for 2013, as no data had been collected on this topic in 2009. In the following the focus will be on the e-skills activity index; we first mapped the e-skills activity index values against the Networked Readiness Index (NRI)[2] for each of the 27 Member States.

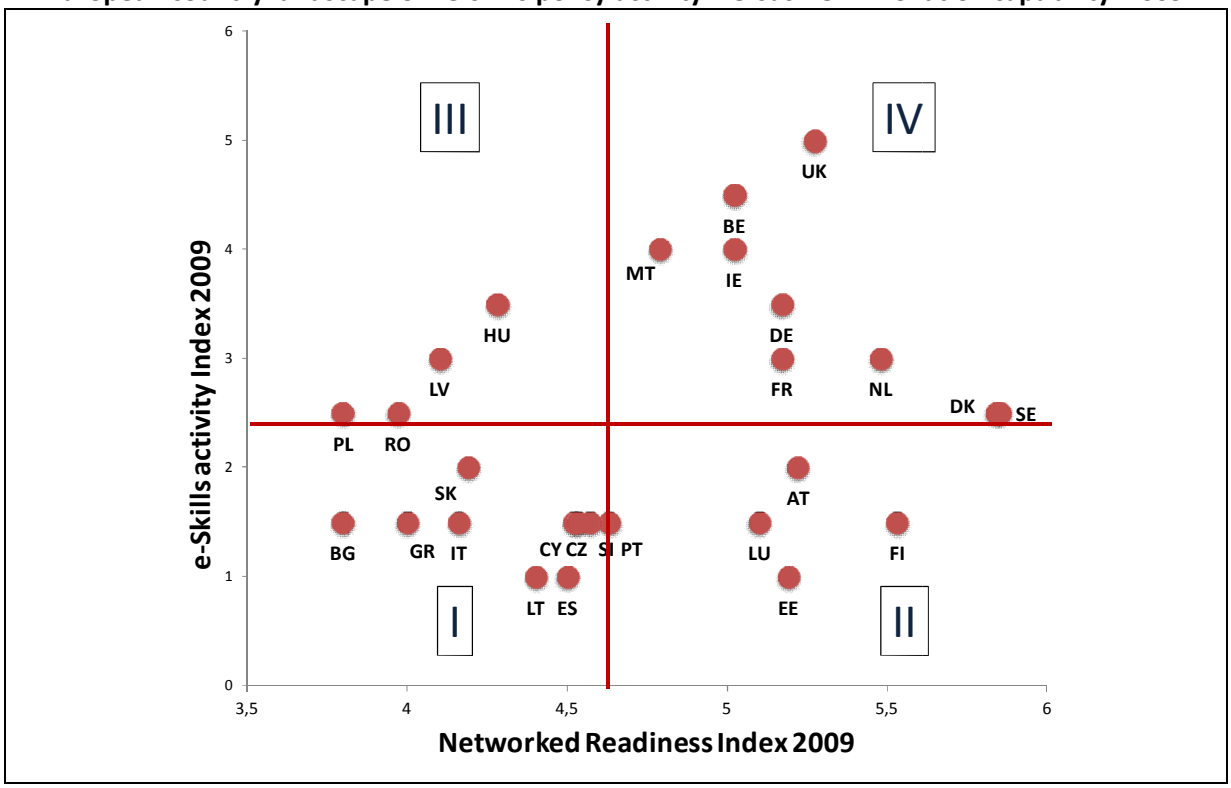
[1] Hüsing, T. and Korte, W.B. (2010) "Evaluation of the Implementation of the Communication of the European Commission 'e-Skills for the 21st Century'", URL: http://ec.europa.eu/enterprise/sectors/ict/files/reports/eskills21_final_report_en.pdf

[2] The World Economic Forum's Networked Readiness Index (NRI) measures the propensity for countries to exploit the opportunities offered by ICT. It is published annually as part of the Global Information Technology Report. The NRI is a composite of three components: the environment for ICT offered by a given country (market, political and regulatory,

This allows for putting the results of the e-skills policy and activity analysis in the different countries in the wider context of each country's propensity to exploit the opportunities offered by ICT using data which can be obtained from the country values on the Networked Readiness Index (NRI).

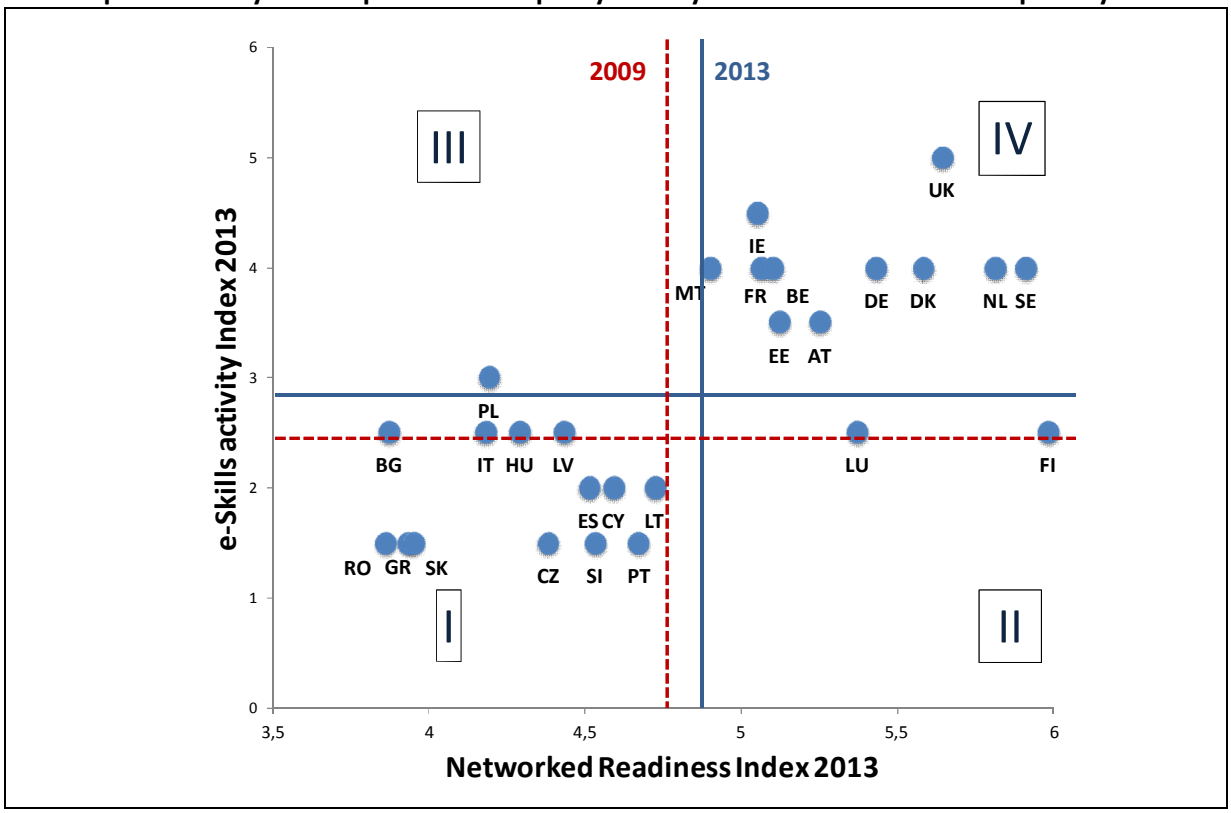
The following figure allows a comparison of the results from this exercise for 2009 and 2013. In the graphical illustrations four quadrants are shown which are built by using the European averages on the NRI and those on the e-skills policy activity index for the respective years in order to group the countries into four main clusters.

European country landscape on 'e-skills policy activity' versus 'ICT innovation capability' 2009



infrastructure environment), the readiness of the country's key stakeholders (individuals, businesses, and governments) to use ICT, and finally the usage of ICT amongst these stakeholders. For further information on the NRI see www.weforum.org/issues/global-information-technology.

European country landscape on 'e-skills policy activity' versus 'ICT innovation capability' 2013



Overall and for e-skills related policies and initiatives a strong increase of activity levels over the five-year time span can be identified. The unweighted average e-skills policy index score increased from 2.4 to 2.9 between 2009 and 2013. This is encouraging news.

Our analysis revealed that in 2009 three of the four quadrants are well populated by different countries with only 7 countries belonging to the group of top performers both, in terms of e-skills policy index as well as NRI, and 11 Member States constituting those best described as low activity countries (bottom left quadrant).

Five years later the situation has changed significantly; we are now faced with a situation which can be described as a dichotomy in Europe on these indicators: top performing countries as opposed to countries with low activity levels and NRI performance, with only three countries (Poland, Luxembourg and Finland) in transition phases between these clusters.

The group of top performers has grown from 7 to 11 with Sweden, Denmark, Austria and Estonia entering this cluster to which the United Kingdom, the Netherlands, Belgium, Ireland, Malta, Germany and France already belonged in 2009. However, the group of low activity countries is still substantial in terms of numbers of countries with 13 EU Member States – almost 50% showing a below average performance on the NRI and on the e-skill skills policy activity index.

EU Member States fall into two very distinct groups: 41% of the Member States are top performers, almost 50% are low activity countries, and 11% located between these two clusters.

While the former have been successful on the e-skills front and capable of exploiting ICT to become innovative and more competitive the latter group of low activity countries still has a rather long way to go to achieve both.

A look at the Member States' positions in the NRI ranking (Networked Readiness Index) reveals that again, those countries with high NRI positions also show high e-skills policy activity levels. The countries moving up in terms of migrating into the 'top performers' cluster include Sweden,

Denmark, Austria and Estonia, as well as the Netherlands and France which managed to further increase their e-skills policy activity level.

Countries at the risk of losing ground include Hungary, Latvia and Romania which dropped down into the first cluster of countries, i.e. those lagging behind.

European country clusters on 'e-skills policy activity' versus 'ICT innovation capability' 2013

I : low NRI + Low level of e-skills policy activity	**II : High NRI + low level of e-skills policy activity**
Romania, Greece, Slovakia, Czech Republic, Slovenia, Portugal, Spain, Cyprus, Lithuania, Bulgaria, Italy, Hungary, Latvia	Luxembourg, Finland
III : Low NRI + high level of e-skills policy activity	**IV : High NRI + high level of e-skills policy activity**
Poland	United Kingdom, Ireland, Sweden, Netherlands, Denmark, Germany, Belgium, France, Malta, Austria, Estonia

5 Selected multi-stakeholder partnerships

The following is a list of multi-stakeholder partnerships of major relevance to the e-skills issue:

- **An Integrated Framework for Design Specifications of the Learning Process in Primary and Secondary Education**: This initiative (2010-13) of the Centre for the Greek Language has been concerned with designing a framework and benchmark for quality training scenarios and learning activities in Greek language across all classes (Elementary, High School) and to establish a dynamic and effective educational environment by making strong use of ICT. Actions are aimed at removing the following three main obstacles to the successful introduction of ICT in the educational process: 1) Lack of integrated methodologies for determining the scope of ICT and their utilization by teachers and students; 2) Lack of appropriate standards and tools for developing quality educational scenarios and learning activities by teachers; 3) Lack of adequate training of teachers in using ICT to create new digital interventions for all subjects and all classes (Elementary, High School). Budget: €1,986,000. Stakeholders responsible are the Greek Language Centre and the Ministry of Education & Religious Affairs.
- **Training in Project Management Software**: The inability of managers to integrate the use of project tracking software has resulted in the provision of poor quality services to their citizens, wasting precious resources and general configuration of an inefficient public administration. The project (2011-13), lead by the National Centre for Public Administration, has aimed to provide an understanding for the participants as well as consolidating the process of planning, organizing and monitoring projects using ICT tools, and skills acquisition program MS Project (or equivalent open source software), through examples and applications. The project evaluation has shown that expected outcomes have mostly been achieved: a) Learners have become able to understand the importance of proper management of human resources to ensure project quality; b) They have understood the importance of identifying the risks of a project and recording scenarios addressing; They have become aware of the key features that have IT projects. The total budget of the project has been € 3.8 million.
- **Highly specialised training to ICT practitioners**: This initiative concerns the provision of specialised training services and is included in the “Employment and Vocational Training” Operational Programme. The main objective is provision of highly specialised training to ICT practitioners among the clients and partners of Oktabit, a private company in the computer distribution business. Training achievements are certified by independent organisations and include: Internet and Computing Core Certification (IC3); Microsoft Office Specialist (MOS);Computing Technology Industry Association (CompTIA Network +). Training is provided by OTEAcademy, a private sector ICT training company and certified Cisco Networking Academy.
- **GetBusy**: This is a joint effort by Greek industry, educational and training institutions, startups and HR agencies, aiming to motivate young people to improve their e-skills and thus their employability, increase their entrepreneurial skills and learn about new technologies. The project started in late 2012 and is led by the Hellenic Professionals Informatics Society (HePIS), an NGO aiming to connect all ICT Professionals (both in academia and industry) in Greece together with Microsoft Greece and PEOPLECERT, a major provider of professional certification. It is financed by the global Microsoft Youthspark program and carried out via the cooperation of : The American College of Greece (Deree College), the ALBA Graduate Business School and 13 other stakeholders and sponsors. The motto of GetBusy is “unleash your potential”, which it tries to achieve by giving free online access to educational material, divided into four categories. The informational and educational material of GeBusy has been designed to meet the priorities laid out in the EU's e-Skills Agenda. It covers training in ICT user

skills (ECDL Core +) and in skills for personal & professional development and entrepreneurship. The website also features an online quiz with attractive prices, based on the educational content on offer, as an incentive for users to take up and finish the course. User response has been very positive: More than 115,000 young people from Greece have already been benefitted and 7,500 candidates have taken part in the online quiz, acquiring knowledge in the fields of digital skills, career development, entrepreneurship and corporate social responsibility. GetBusy received distinction at the European CSR Awards 2013.

6 Success of e-skills policies and activities in meeting the objectives of the EU e-skills agenda and other relevant European initiatives

The extent to which policies, initiatives and multi-stakeholder partnerships have been successful in helping meet the objectives of the EU e-Skills agenda and other relevant European e-Skills initiatives as seen by national experts is further described below along key actions and action lines of the EU e-Skills strategy and other relevant EU initiatives.

"Longer term cooperation"

Certain initiatives such as the changing of curricula through the centre of the Greek language aim to provide the necessary materials such as educational scenarios as well as good teaching practices which could be effectively implemented in the Greek schools and classes. Main target is to change the classroom and the teaching materials into a more e-skill friendly environment and provide a curriculum that will increase pupils' e-skills as well as improve competences in the field.

Furthermore there is a tendency towards the design, development and integration of new academic courses involving e-skills as well as e-leadership such as from the University of Macedonia.

Efforts from the industry such as the Microsoft project Partners in Learning have been very beneficial for Greece. Through the project Microsoft aims to create a group of innovative educators-experts in the field of effectively integrating information technology into education. The efficient utilisation of certain educational tools that enhance learning and improve students; participation and collaboration is achieved by the specific project. Since the program initiated there is a database of good practises enriched by the teachers and also an award for the best projects. For the participants in the project increase in e-skills as well as change in teaching and learning was noted.

The above seemed successful efforts to meet the objectives of the EU e-Skills agenda and other relevant European e-Skills initiatives.

"Human resources investment"

There is a high level of learners in Greece on these subjects as well as development of training courses and post graduate studies involving the specific field. However there is a shortage of jobs in the sector at the time as well as not quite that many courses on advanced IT skills. It seems that there is a need for the available courses being directed towards what the market wants and to where the market is heading. For example, there are not many courses in mobile app development which seems important for the present development in the field and the market needs. There are only a few cases of people who have created, through their own initiative and knowledge, certain apps and acquired, as the example of Alex Christodoulou, funds as a start-up enterprise. It seems that the academia and the state should regard this matter and take immediate action.

"Attractiveness of ICT jobs"

In a country with unemployment rates reaching 60% for the age group 15-24, the chance to get employment alone is motivation enough to seek appropriate education. In general, available evidence suggests that ICT jobs do appear attractive to young Greeks, although mainly men. There is a general awareness that to be able to find employment, a qualification may need to be very specific, i.e. what the market requires may not be ICT practitioner skills in general but rather a specific set of skills requried for development of mobile apps.

"Employability and e-inclusion"

Unfortunately in Greece there is low employability in the area studied due to the recent financial crisis and underdevelopment. A need for investments and increase of e-skills is imperative for the decrease of the unemployment rates. The GetBusy initiative is pointing in the right direction, as it has a strong focus on ICT user skills as means to increase employability.

"Lifelong acquisition of e-skills"

A new trend for lifelong learning and continuous training is currently being observed in Greece, partly due to the introduction of employee evaluation procedures in the public sector, which has lead to increasing numbers of participants in relevant courses. This trend is also reflected in growing numbers and greater take-up of e-learning courses. This has brought up the issue of the quality of available training offers. There appears to be a lack of effective training courses and qualified training staff, especially in so far as the latest developments in the field are concerned. As a consequence, learning outcomes tend to be below expectations. There is a need for quality controls and evaluation of trainers and course programmes. Recently the process of accreditation of adult trainers who are already in service has started. The responsible organisation is EOPPEP, the National Organisation for the Certification of Qualifications & Vocational Guidance. Teaching staff will need to sit exams and provide a 20 minutes teaching demonstration which is recorded and evaluated according to minimum requirements before they can obtain the certificate.

"Closing the e-Skills gap"

There is a need for advanced courses in certain specialized fields of ICT. There are not many training courses regarding advanced and contemporary training in e-skills in Greece. Also training should be available in remote areas such as the islands since broadband connection are now up-and-running in those parts of Greece as well. Furthermore, the need to overcome bureaucratic obstacles, lack of effective communication and collaboration is more important than ever.

More generally, Greece today suffers from a range of problems which keep back progress in addressing the e-skills challenge:

- The prospect of budget deficits which will restrain public spending for many years to come;
- A widespread lack of vision for the future;
- A tendency to seek simple transfer of knowledge form abroad without any modification and tailoring to suit the Greek educational environment and general conditions;
- Lack of strategic planning with clear outcome targets;
- Widespread use of trial and error methods
- Lack of well-qualified training staff and the edcuational infrastructure they require to work efficiently;
- Lack of effective evaluation systems for projects which have already been implemented and may need to be adjusted to adapt to the new national environment.

At the time of writing, preparation of Cohesion Policy for 2014-2020 is in full speed. A significant change in the national e-skills policy is foreseen; it will be reflected in the relevant policy documents and embedded in the objectives set for the new programming period.

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Annex: data sources

	Source
eSkills21 study: 'e-skills' index 2010	eSkills21 study carried out by empirica. Report available at http://goo.gl/WKV7r
eSkills21 study: 'Digital literacy' index 2010	
EuRA e-skills index	EU-RA 2009: Financial and fiscal incentives for e-Skills: State of play in Europe. Synthesis report. http://www.e-skills-funding.com/images/stories/PDF/synthesisreport.pdf
ICT practitioners in % of total employment 2012	LFS data made available by Eurostat
Digital literacy skills of the population 2009/11:	Eurostat, database "isoc_ski"
• Individuals with high level of computer skills	
• Individuals with high level of Internet skills	
• Individuals using the Internet (last three months)	
Global Competitiveness Index (GCI) 2010/12	The Global Competitiveness Report 2011-2012: http://www.weforum.org/reports/global-competitiveness-report-2011-2012
Networked Readiness Index (NRI) 2010/12	The Global Information Technology Report 2011-2012: www.weforum.org/issues/global-information-technology
• Individual readiness	
• Business readiness	
• Government readiness	
• Individual usage	
• Business usage	
• Government usage	
PISA scores (2009) in:	OECD, http://www.oecd.org/pisa/
• Mathematics	
• Science	
• Reading	

Indicator	Source	Further remarks
ICT practitioner workforce 2012	Eurostat Labour Force Survey. Some imputations and assumptions not in the original data but done by empirica apply	The definition can be looked up in the final report, Gareis et al. 2014: E-SKILLS: MONITORING AND BENCHMARKING POLICIES AND PARTNERSHIPS IN EUROPE.
ICT practitioner workforce 2012 as percent of total workforce		LFS based, number of ICT practitioners / number of workers in all occupations
Assumed excess demand 2012	Empirica, IDC	This is calculated using the percentage of vacancies per existing job and is based on a survey carried out in 2012. As some countries were not covered, several assumptions apply
Forecast excess demand 2015		Forecasts are scenario based and the methodology can be found in the final report (see above). Forecast of demand in the six largest countries (DE, UK, FR, IT, ES, PL) is based on country specific economic scenarios, for the 21 smaller countries only an aggregate scenario was developed and figures allocated according to ICT employment shares.
Forecast excess demand 2020		
Forecast ICT practitioner jobs 2015		
Forecast ICT practitioner jobs 2020		
Workers 2012 - Management,	Based on Eurostat Labour Force	LFS based, definitions can be looked up in the final

business architecture and analysis level	Survey, some definitions and calculation by empirica. Some imputations and assumptions not in the original data but done by empirica apply.	report.
... as percent of total workforce		
Workers 2012 - ICT practitioners, professional level		
... as percent of total workforce		
Workers 2012 - ICT practitioners, technician and associate level		
... as percent of total workforce		
Growth core ICT workforce 2001-2010	Based on Eurostat Labour Force Survey, some definitions and calculation by empirica. Some imputations and assumptions not in the original data but done by empirica apply.	ISCO-88 groups 213 and 312. Due to the break in series in 2010/11 only partly comparable to later data.
Growth core ICT workforce 2008-2010		
Growth core ICT workforce 2011-2012		ISCO-08 groups 25 "ICT professionals", 35 "Information and communications technicians".
Growth broad ICT workforce 2011-2012		Equals the "ICT practitioner workforce"
ISCED 5A/B first degree graduates in Computer Science, 2011	Eurostat, database "educgrad_5"	This figure represents a count of first degrees in ISCED 5A and first qualifications in 5B. See discussion of this indicator in the final report.
... graduates per 1000 population aged 20-24	Eurostat, databases "educ_grad5" and „demo_pjangroup"	Graduates as above. The denominator is used to make data comparable but there is no age restriction in the number of graduates. Some imputations and assumptions may apply.
... graduates 2011 as percent of 2006 (= peak EU)		
Vocational training graduates in Computer Science, 2011	Eurostat, database "educ_grad5"	Number of Computing graduates in Upper secondary education (level 3) - pre-vocational and vocational programme orientation and Post-secondary non-tertiary education (level 4) - pre-vocational and vocational programme orientation. Some imputations and assumptions may apply.