

A common European response to shared goals

A concept for tackling the digital skills challenges in Europe

Outcome of the DSM Sub-group on digital skills

Introduction

As announced in the Communication on a New Skills Agenda for Europe¹, the European Commission is launching the Digital Skills and Jobs Coalition to tackle growing digital skills deficits in Europe and provide all EU citizens with the skills they need to thrive in a digital economy and society. The initiative seeks to develop a large digital talent pool and ensure that individuals and the labour force in Europe are equipped with adequate digital skills. Development of these skills is becoming increasingly essential, not least in view of cutting-edge developments in the areas of artificial intelligence and robotics and the increasing importance of human-machine interaction. In this context, Member States have been invited to develop **comprehensive national digital skills strategies** by mid-2017 on the basis of **targets** to be set by the end of 2016. To implement their strategies, Member States have been asked to work together with existing **national digital skills coalitions** or establish them where they do not exist.

To support the development of national strategies, the Commission set up an expert group on digital skills, as a sub-group to the already existing Digital Single Market strategic group. This document presents the outcome of the work of the sub-group to develop a "shared concept" for a digital skills strategy. In doing so it responds to the request made to Member States by Commissioner Oettinger at an Informal Ministerial debate on Digital Skills, held in December 2015, to elaborate a European framework, or blueprint, for a digital skills strategy in order to accelerate the implementation of digital skills strategies across Europe.

What is the shared concept?

The shared concept is a kind of model or template for a digital skills strategy which identifies the main **challenges** to be addressed in order to effectively tackle digital skills gaps in Europe. It proposes a list of possible **solutions** to these challenges. Member States have also gathered a selection of **best practice initiatives**, mapped to the identified challenges and solutions. The work on the shared concept and related best practices is intended to be published and disseminated via a web platform.

It identifies four main challenge areas or target groups for the acquisition of digital skills: 1) education, (2) citizens (3) the labour force, 4) and ICT professionals. Below is an **overview of the corresponding challenges** identified in the shared concept for each target group:

1. Education:

To provide citizens with the digital skills they need for their lives, we need a modern education system that equips young people with the skills they need to thrive in the digital economy. While progress is being made in modernising our education and training system, it is still very much a patchwork. While in some countries and schools there are

¹ <http://ec.europa.eu/social/main.jsp?catId=1223>

high levels of equipment, skilled teachers and modernised curricula, it is not the case everywhere. Indeed, on the basis of the last available data only 20-25% of students in Europe are taught by digitally confident and supportive teachers having high access to ICT and facing low obstacles to their use at school.

Identified Challenges:

1.1. Providing adequate ICT infrastructure in schools

1.2. Modernising and up-to-dating teaching content and pedagogies

1.3. Up-grading teachers' skills

1.4. Strengthening cooperation between education and industry

2. Citizens:

Citizens need digital skills for more and more aspects of their lives. Yet still too many people do not have the basic skills they need to succeed in an increasingly digital society. Around 45% of EU citizens still do not have basic digital skills with around half of this figure having none at all. In some Member States, a majority of citizens do not go online on a regular basis or cannot function effectively online. They miss out on many life enriching opportunities and economic benefits. This is particularly the case for certain segments of the population including older people, the less educated and those on low incomes.

Identified challenges:

2.1. Developing a common definition and understanding of what digital skills and competences are

2.2. Overcoming the obstacles and/or limitations some people face to obtaining digital skills - including lack of interest, awareness, resources and/or knowledge, as well as fear of technology and importantly disability

2.3. Providing relevant digital skills training opportunities for all

3. The labour force:

As digitisation spreads to all sectors of the economy, digital skills are increasingly needed for most jobs. Indeed, most jobs already require basic digital skills. In the future this will only increase and it can be argued that all labour force participants need these skills to remain employable and for entrepreneurship. Despite this, around 37% of the labour force (employed, self-employed and unemployed) in the EU does not have even basic digital skills. The European labour force needs to be re-skilled for its digital future.

Identified challenges:

3.1. Improving the understanding and definition of digital skills needs

- 3.2. Upgrading the digital skills of the labour force
- 3.3. Creating new opportunities and challenges.
- 3.4. Strengthening collaboration across relevant stakeholders.
- 3.5. Improving managers' digital skills or so-called "eLeadership" skills.

4. **ICT professionals:**

Digitisation is also leading to increasing demand for ICT professionals in all sectors of the economy. Indeed already more than half of all ICT professionals work outside the ICT sectors in ICT-using industries such as automotive, pharmaceuticals and the like. Employment of ICT professionals has increased by around 1.5 million over the last five years alone. However, supply is not keeping pace with demand and it is expected that by 2020 Europe could have around 756 000 unfilled vacancies for ICT professionals. At the same time, we have almost 20% youth unemployment in the EU. We need to train more young people for these new digital jobs.

Identified Challenges:

- 4.1. Making the ICT profession more attractive as a career choice, with a focus on encouraging more women
- 4.2. Increasing the number of young people trained for ICT professions (ICT graduates and conversions to ICT)
- 4.3. Ensuring certification and standardisation
- 4.4. Upskilling of ICT professionals in a life-long-learning perspective

How should it be used?

The shared concept can be used by Member States to guide them in developing their own national digital skills strategies. It can be used by Member States to augment their already existing initiatives by enabling them to map their existing activities against identified challenges thus highlighting potential gaps and the need for additional measures to be adopted when developing their digital skills strategy. Thus it contributes to the design of comprehensive strategies covering the full range of needs in terms of digital skills.

The sharing of best practices reinforces the impact of this model by providing concrete examples of successfully implemented initiatives which could be replicated and scaled up to address the same challenges identified in other regions.

Table of solutions to the challenges identified in the concept

Target Group	Challenges	Actions
1. Education	1.1 Providing adequate ICT infrastructure in schools	<p>1.1.1 Ensure that schools have good quality ICT infrastructure including a good broadband connection and that teachers and students have a range and a sufficient provision of different technological devices and software for use in educational contexts. This could include through "Bring-Your-Own –Devise" (BYOD) policies, but should also ensure provisions for low-income groups.</p>
	1.2 Modernising and up-to-dating teaching content and pedagogies	<p>1.2.1 Support sustained investment and funding for the continuous updating of tools and digital pedagogies/methods in education.</p> <p>1.2.2 When designing and re-designing curricula:</p> <p>(i) Systematically consult a wide range of stakeholder groups involved in digital skills and ICT (e.g. other ministries, industry, non-profits alongside teachers, school leaders, and parents).</p> <p>(ii) Explore how to best design & implement curricula and concrete teaching & learning to enable up-to-date content and pedagogies, in particular as regards digital skills and competence education. Including by bringing in technical experts from companies in the ICT sector to help the design of lessons and educational materials; also encourage and enable experts to teach and train where appropriate.</p> <p>(iii) Promote tried & tested digital pedagogies, also across borders (best practices exchange and translation).</p> <p>1.2.3 Teach children and young people how to use digital technologies already at a young age (already in pre- and primary school) and throughout the education system. Ensure that both the use of digital</p>

		<p>technologies and their deeper workings are taught, to enable active & creative participation in the digital world (help students learn how to learn and work with technology) and labour market.</p> <p>1.2.4 Include computer science courses, including computational and creative thinking, as well as cyber security and media literacy in compulsory and tertiary education.</p> <p>1.2.5 Encourage the provision and use of open educational resources (OER) and lifelong learning offers, such as Massive Open Online Courses (MOOCs) or mobile and app-based education, and enable their recognition with formal education and for employment.</p>
	<p>1.3 Up-grading teachers' skills</p>	<p>1.3.1 Update initial teacher training and qualifications, in light of fast changing ICT, including their validation and formal recognition.</p> <p>1.3.2 Increase and improve continuous professional development for teachers to raise their awareness as well as level of digital skills, help them understand the impact of digital technologies on their specific subject and encourage them to use innovative/digital pedagogies.</p> <p>Lifelong learning can be supported through, e.g. MOOCs for teachers (explore certification of platforms and learning outcomes, testing outside MOOC environment).</p> <p>1.3.3 • Facilitate peer learning, e.g. by encouraging support coaching for teachers trainers (coaching), development of communities of practice, etc.</p> <p>1.3.4 Attract and facilitate career mobility from industry into teaching.</p>
	<p>1.4 Strengthening cooperation between education and industry</p>	<p>1.4.1 Strengthen ongoing dialogue and closer cooperation between industry, education and government as well as social partners -</p>

		<p>possibly in the context of a National Coalition for Digital Jobs:</p> <ul style="list-style-type: none"> (i) to support mutual understanding of needs, (ii) for sharing information about companies' digital skills needs, (iii) to enable the development of up-to-date, labour market relevant curricula and (iv) to support closer cooperation in education and training. <p>1.4.2 Encourage strong practical components in education (in particular HE and VET) and further stimulate work based learning as an integrated part of vocational education and training in the field of ICT.</p> <p>1.4.3 Encourage and incentivise organisations to offer good quality, paid traineeships, apprenticeships and other types of work-based learning in the field of ICT and digitisation.</p> <p>1.4.4 Encourage companies to provide schools with free or discounted access to software and platforms for educational purposes.</p> <p>1.4.5 Encourage companies to offer teachers training</p>
<p>2. Citizens</p>	<p>2.1 Developing a common definition and understanding of what digital skills and competences are</p>	<p>2.1.1 Support and encourage the take up and development (also of different language versions) of Competence frameworks such as the European Digital Competence Reference Framework (DigComp) in the Member States to foster a common understanding of digital competences across the EU and to make sure it remains relevant.</p>
	<p>2.2 Overcoming the obstacles and/or limitations some people face to obtaining digital skills - including lack of interest, awareness, resources and/or knowledge, as well as fear of technology and importantly disability</p>	<p>2.2.1 Identify the main groups within the population with no or low levels of digital skills (e.g. low educated, elderly, low income, disabled etc.), determine the specific issues they face and develop tailor-made support for each group in order to encourage their use of digital</p>

		<p>technologies and development of digital skills.</p> <p>2.2.2 Design and carry out targeted awareness-raising campaigns for identified target groups i) to promote the benefits of using digital technologies and learning digital skills, ii) to encourage the use of digital (public) services and iii) to inform and educate people about how to use ICT in a responsible and secure way.</p> <p>2.2.3 Promote digital skills education and training of mentors, guardians, carers and other disseminators, such as professional educators, trainers and other education professionals</p> <p>2.2.4 Develop and implement 'digital by default' policies across all public services, to demonstrate the benefits of digitisation (of services) for people's daily-lives and encourage digital adoption and skills.</p> <p>These policies should ensure a high level of awareness, accessibility, user-friendliness and inter-operability and take into account the particular requirements of persons with disabilities and age-related limitations.</p> <p>They should also include incentives and support for the use of digital services, adapted to the needs of different groups.</p>
	<p>2.3 Providing relevant digital skills training opportunities for all</p>	<p>2.3.1 Design and implement low-threshold, tailor-made, basic digital skills (digital competence) training and further education opportunities for people with low levels of digital skills, including in particular the elderly, people with a low level of education, people with disabilities and people with a migration background.</p> <p>2.3.2 Support in particular libraries, NGOs and volunteers who offer training in digital skills. Encourage and/or incentivise schools, libraries and other public institutions to make use of their facilities, while not</p>

		<p>occupied with other activities, for providing digital skills training to identified groups.</p> <p>2.3.3 Make MOOCs and e-learning more readily available to citizens.</p> <p>2.3.4 Encourage the spread of intergenerational models (the young teaching the old) to support the acquisition of digital skills by older people.</p> <p>2.3.5 Use crowd-funding to support social innovation platforms to provide training (e.g. in coding) open to all, with a focus on under privileged youth.</p> <p>2.3.6 Consider using financial incentives for organisation to provide and/or for individuals to obtain digital skills training -. Such as tax breaks and digital skills vouchers.</p>
<p>3. Labour Force</p>	<p>3.1 Improving the understanding and definition of digital skills needs</p>	<p>3.1.1 Make better use of the EU skills panorama, which could help better assess and anticipate skill needs and make education and training systems more responsive to labour market needs.²</p> <p>3.1.2 Improve data on digital skills needs anticipation and analysis by:</p> <p>(i) making use of advanced web analytics tools (e.g. web crawling for job offers, Business Intelligence etc.);</p> <p>(ii) seeking evidence from different sectors in order to understand digital skills needs in ICT-using industries;</p> <p>(iii) and taking into account geographical scope, i.e. understanding the</p>

² <http://skillspanorama.cedefop.europa.eu/en>

		<p>needs at national, regional and local level.</p> <p>3.1.3 Encourage EU-wide take-up of the (adapted) DigComp framework, as well as its update based on Member States’ feedback and new technological developments (see point 2.1).</p> <p>3.1.4 Establish closer contact and exchange of information and data between the public and private sector and between industry and education, since companies are best placed to understand work-based skills needs (e.g. by surveying companies and through sectorial approaches).</p>
	<p>3.2 Upgrading the digital skills of the labour force</p>	<p>3.2.1 Get employers to commit to train and re-train their workforces and implement lifelong learning policies, for skilled and un-skilled workers alike, to strengthen digital skills at all levels and accompany it with appropriate certification.</p> <p>3.2.2 Identify Digital Champions within companies to follow the technology trends and lead the update and introduction of new digital skills to keep up the labour force updated. This goes away from the traditional CIO who is more responsible for the information systems.</p> <p>3.2.3 Support schemes whereby the unemployed can have access to digital skills through short term programmes, possibly on the basis of existing local demand.</p> <p>3.2.4 Make use of European funds (ESF, EFSI, YEI, Erasmus+ etc.) to enable training in digital skills.</p> <p>3.2.5 Carry out awareness raising activities (e.g. public dialogues or conferences on the need to reskill and up-skill the labour force) to inform and convince managers of SMEs and entrepreneurs in all sectors of the potential and relevance of digital technology for their</p>

		<p>businesses.</p> <p>3.2.6 Support SMEs to train their staff. Collective training and funding solutions could be found through promotion of collaboration within their SME eco-systems and local suppliers. Use should be made of available EU funds and governmental funding opportunities for SME training could be established.</p> <p>3.2.7 Governments should lead the way with "digital by default" policies, to encourage SME's use of digital public services and thus develop their digital skills.</p> <p>3.2.8 Ensure all civil servants are adequately digitally skilled for successful implementation of "digital by default" policies.</p>
	<p>3.3 Creating new opportunities and challenges</p>	<p>3.3.1 Raise the awareness of workers and companies about the benefits of digitisation in the work place and obtain better evidence about the impact on the labour market to avoid speculation and fears of job destruction.</p> <p>3.3.2 Citizens should be able to access information about future jobs opportunities to guide them in their training/educational choices. Improved and widely accessible career guidance, also for those already in employment, can help to inform their choices.</p> <p>3.3.3 Social partners should discuss the impact of digitisation on working conditions and jointly develop solutions.</p>
	<p>3.4 Strengthening collaboration across relevant stakeholders</p>	<p>3.4.1 Establish national coalitions for digital skills and jobs connecting all relevant stakeholders and bring them together at European level.</p> <p>3.4.2 Foster a community around progress in developing digital skills</p>

		for labour forces and ensure regular meeting points and events.
	3.5 Improving managers digital skills or so-called "eLeadership" skills	3.5.1 Promote the uptake of digital skills for managers ("eleadership" skills), including skills to support entrepreneurship.
4. ICT professionals	4.1 Making the ICT profession more attractive as a career choice, with a focus on encouraging more women	<p>4.1.1 Undertake awareness raising actions to attract young people, especially girls, to ICT; for example by sending IT professionals to schools to talk about careers in ICT.</p> <p>4.1.2 Encourage and support students', particularly girls, interest in IT professions and career choices through the formal education system (e.g. curricular measures) as well as non-formal and informal (NGO's etc.) education.</p> <p>4.1.3 Strengthen ICT professionalism in Europe and scale-up EU-wide and national initiatives to define and foster the highest standards for the ICT profession.³</p>
	4.2 Increasing the number of young people trained for ICT professions (ICT graduates and conversions to ICT)	<p>4.2.1 Take measures to increase the numbers of young people studying and graduating in ICT, for example through offering study grants or stipendia, and reducing drop-out rates from ICT and STEM studies.</p> <p>4.2.2 Support the development and spread of short-term training programmes for young people (ICT and other graduates) to take up ICT jobs</p> <p>4.2.3 Encourage and facilitate internships in companies' IT departments.</p>

³ <http://www.ecompetences.eu/>

https://standards.cen.eu/dyn/www/f?p=204:7:0:::FSP_ORG_ID:1218399&cs=1600F0DD849DA04F3E3B900863CB58F72

	<p>4.3 Ensuring certification and standardisation</p>	<p>4.3.1 Develop and make use of ESCO as a catalogue of all ICT professions.</p> <p>4.3.2 Support the recognition and transparency of digital skills acquired in informal and non-formal education and ensure their consideration for further formal education.</p> <p>4.3.3 Government should implement and support the use of the European e-Competence Framework for IT-professionals to enhance quality and comparability of advanced digital skills. Localise/adapt the e-Competency Framework for small states and small organisations (micro organisations).</p>
	<p>4.4 Upskilling of ICT professionals in a life-long-learning perspective</p>	<p>4.4.1 Encourage employers to take a bigger responsibility to continuously train their workforce and encourage voluntary professional development.</p> <p>4.4.2 Develop Lifelong learning programmes for ICT professionals.</p> <p>4.4.3 Ensure that there are training opportunities available in higher education for up-skilling of ICT professionals.</p> <p>4.4.4 Update and up-skill older professionals with the new technologies, including the old ICT professionals who may have retired but they still have a lot to give.</p> <p>4.4.5 Mobilise social partners to find joint solutions to retrain the ICT workforce.</p> <p>4.4.6 Provide opportunities for people in other careers, the unemployment or those who did their education in other fields, training towards a career in as ICT professional and other digital jobs.</p>

