

DECODE



**DEvelop COmpetences in Digital Era.
Expertise, best practices and teaching in the XXI
century**

**IO2. Innovative training models, methods and
tools for teachers in the digital age**

COMPARATIVE REPORT

Authors:

Antonio Coccozza

Mario Pireddu

Emanuela Proietti

Lucandrea Massaro

Version:

October 2017



Erasmus+



TABLE OF CONTENTS

| | |
|--|----|
| Forward | 4 |
| Introduction | 5 |
| 1. The national contexts..... | 7 |
| 1.1. National legislative framework..... | 7 |
| The adoption and the development of ICT in education | 8 |
| Institution, organisational processes and key figures | 9 |
| Financing projects supporting innovative didactic approaches based on ICT | 10 |
| 1.2. Contractual framework | 11 |
| Career perspective for school leaders and teachers and the framework of professional competences... .. | 11 |
| Assessment and Quality Assurance Systems | 11 |
| 1.3. Teaching digital skills | 12 |
| Experiences in the field of training teachers' digital skills | 12 |
| Pedagogical models in teachers' digital skills..... | 18 |
| Final considerations..... | 20 |
| 2. The national survey results..... | 23 |
| 2.1. The main issues emerging from the focus groups | 23 |
| Introduction | 23 |
| Innovation and digital revolution | 23 |
| New competences required | 25 |
| Professional development | 26 |
| Pedagogical issues..... | 27 |
| Best Practices..... | 30 |
| 2.2. Deepening interviews | 32 |
| Introduction | 32 |
| European recommendations and current national policies..... | 32 |
| National policies for ICT and innovating education..... | 33 |
| Digital challenges for national education systems | 37 |
| Problems in implementation process..... | 39 |



| | |
|--|----|
| National specificity that is considered useful to enhance | 40 |
| Opportunities in teacher training for the enhancement of their digital skills..... | 41 |
| Needs and perspective of improvement | 41 |
| 3. Concluding remarks..... | 43 |
| 3.1. Where we stand and perspectives: a transnational SWOT analysis..... | 43 |
| 3.2. Recommendations | 44 |



COMPARATIVE REPORT

IO2 - Expertise, best practices and teaching in the XXI century

Forward

The present report is part of the second intellectual output (IO2) planned within the DECODE PROJECT - DEvelop COmpetences in Digital Era. Expertise, best practices and teaching in the XXI century, an Erasmus+ KA2 - Strategic Partnerships in the field of Education.

The IO2 focuses on National Researches on "Innovative training models, methods and tools for teachers in the digital age" and it has been realized on the bases of IO1 - Research methodological design, tools and outputs prepared by University Roma Tre in the first phase of the project.

The National reports aimed to feed into the next research process in the Project DECODE, giving important information about national implementation process regarding the incorporation of ICT in schools and didactical practices.

They focus on national education policies, training models and successful methodologies to develop school staff (teachers, headmasters, administrators, etc.) digital, methodological and socio-relational skills requested by digital era.

Based on the methodological design of IO1, the National reports explore the governance practices in order to understand:

- what innovative policies were implemented;
- significant experiences spread in the countries of the project (Italy, England, Finland, Romania and Spain);
- classification of profiles and skills of educational professionals in the ICT field;
- best practices and educational successful methodologies, spread in the participating countries.

The present Report provides a comparative analysis of the most significant results of the national researches, trying to present them in terms of remarkable characteristics, common elements and notable differences.



Introduction

The development of an innovative educational model requires taking into account a digital revolution, which involves the whole educational community at various levels: political, institutional, organisational, but also at a pedagogical level.

Through the national reports "Innovative training models, methods and tools for teachers in the digital age", the research team tried to assess the current school needs, to identify the key digital opportunities and risks in a procedural and organizational perspective in the project countries.

To reach the objective, the national researches present:

- a new understanding of the national contexts: trends and policies activated at national level in relation to the introduction of training models and successful methodologies to develop the school staff' digital competences;
- the national legal framework and the available funding programs;
- the framework of contractual rules and career perspective in relation to the educational digital challenges;
- the identification of local good practices.

To reach these goals, as defined in IO1, a qualitative approach has been used. Focus groups and interviews has been organised through a three months period (March to May) to reach key actors (policy makers, decision makers, institutional representatives). The objective was to evaluate the steps taken for the integration of ICT in the education system and teaching practices. The reports present the emerging key elements of the national context and the main and the most relevant results of the national research.

Research activities realized in the five countries are:

| | Focus group | Target / Number / Location | Interviews | Target / Location |
|----------------|-------------|---|------------|---|
| Italy | 4 | Head Masters: 5 / Rome 11 / Genoa 12 / Bari Animatori Digitali: 12 / Online environment | 5 | Institutional Key Actors / National |
| England | 2 | School ICT Staff and Teachers: 25 / Bradford | 5 | School leaders with focus on digital leads / National |
| Finland | 3 | Head masters, ICT tutors - members of digital team, head of departments 20 / Helsinki, Espoo, Uusimaa region | 5 | Director general in Finnish National Agency for Education; Councillor of Education at Finnish Agency for Education; Director of Education in Espoo city; Vice Chairman of OAJ, the Trade Union of Education; |



| | | | | |
|----------------|---|--|---|---|
| | | | | Vice chairman of The Advisory Board of the Education and Early Childhood Education Board in Espoo |
| Romania | 3 | Head Masters: 3 / Bucharest 4 / Focsani 1 / Odobesti 1 / Ploiesti 5 / Iasi ICT School leaders: 1 / Bucharest 1 / Ploiesti 2 / Focsani 1 / Odobesti 5 / Iasi | 5 | Decision makers, School county inspectors / Bucharest, Iasi, Vrancea |
| Spain | 1 | ICT experts, school teachers, TAC coordinators National, mainly of the autonomous community of Catalonia: 24 | 5 | Experts in the education ICT policy area / National |

Based on the national reports, this document is articulated in two main sections.

The first part presents the main elements of the analysis of the national contents and the second one describes the main results of the field researches, with particular attention to emerging strengths, weaknesses, risks, threats and opportunities.

The first part offers a comparative analysis of the five national frameworks, with particular attention to: the national legislative framework for the adoption and the development of ICT in education (specific laws, decrees, acts, ministry orders etc.); the institutional and organisational processes; the key institutional framework; the financing programs supporting implementation of innovative didactic methods based on ICT; the contractual framework and career perspective for school leaders and professors, the professional profiles and competence, and the assessment and quality assurance systems; the main and most interesting experiences in the field of training teachers' digital skills as well as the main and most interesting pedagogical adopted models in teachers' digital skills.

The second part presents the main issues emerging from the focus groups and the interviews.

Finally, a brief reflection about the most important results of the comparative analysis concludes the report: it is offered in the form of a comprehensive SWOT analysis of main emerged issues.



1. The national contexts

1.1. National legislative framework

Framework of ICT in education, in every country involved in DECODE projects, is polyhedric and much more different for national culture that produces different kind of school's educational program. From the Finnish paradox – that has not a specific law about ICT's learning but the most interesting use of digital opportunity in their school – to the Romanian difficulty with having digital competencies as it results in the Digital Economy and Society Index (DESI): last one in EU. In the midst of these, there are some countries: England (and Wales in report), Spain (and Catalonia), Italy (see below in text).

Although Eurydice report (2011), Key Data on Learning and Innovation through ICT at school in Europe, recommended the promotion of innovative pedagogical approaches, to enable students to learn in appropriate ways, every country response to this is different. In depth:

Finland - There are no policy provisions on ICT in school education, but a major reform to improve mathematical and programming skills, even in lower grades of their schooling path. Compulsory school starts at 7 years. Each subject at school uses a variety of learning methods, giving the pupils chances to learn different skills.

The government launched an action plan to revamp comprehensive schools in the autumn 2016. "It serves to put the new curricula into practice and responds effectively to existing and imminent challenges in comprehensive school education. As outlined in the Government Programme, EUR 90 million will be used over three years to execute the plan. Of these resources, around EUR 8 million was made available in autumn 2016 through the Finnish National Board of Education for activities relating to experimenting, development and innovation, and roughly EUR 7.5 million will be disbursed for training and activities for tutor teachers".

England - There is not formal legislation. Instead, the government's approach has been to hand responsibility to individual institutions to develop their own approaches and strategies towards the use of ICT in the classroom. Institutions/practices which work particularly well are monitored by the government, who then circulate and promote best practice examples. The Joint Information Systems Committee (JISC) sponsored within the Further Education Learning Technology Action Group (FELTAG) report gave impetus to ideas and developments around online and digital teaching. With no government support on actively pursuing a digital strategy, funding for these staff costs needs to be found from within existing budgets of singular school.

Italy - The 2002/2003 school year is to be considered the birth of the first online environment for systematically training teaches, called the PUNTOEDU platform, an e-learning platform managed by INDIRE (National Institute of Documentation and Educational Research) for the implementation of compulsory training courses for the newly-to be trained teachers. However, first attempt to introduce ICT in compulsory school was inaugurated into the Italian education system by Law 59/1997 art. 21, and it has been developing since then up to today with many experimental projects that involved thousands of schools patchy in the country. From 1997 to 2000 the National Plan of Didactic Technologies (PNTD in Italian) was held, the most important initiative that for the first



time introduces computer science and telematics in all classes and grades of the school and training for all teachers. Last school reform was introduced by Law 107/15 that starts a new PNTD with a specific allocation for 2015-2020 period.

Spain - At a general level, the inclusion of educational policies for the integration of ICT into the education system has been progressive. In reference to specific laws, decrees and acts, references in the implementation and use of ICT can be found in successive Spanish laws. In this sense, this implementation in the last three educational reforms: LOGSE (1990 not on ICT but introduce the concept of knowledge society), LOE (2006 concentration on mathematical and linguistic skill, mention on ICT), LOMCE (2013 ICT is one of the axis of the modernization of the education). Catalonia approve similar law in 2009 with the LEC and “rearranged” by Government of Catalonia in 2013.

Romania - Ministry of Education launched in 2001 the national program Digital Education System which lasted for 10 years. In 2011 a new National Education Law nr. 1/2011 is issued (which states that the national preuniversitary curriculum pursues the development of the key competences, including the digital competence as defined by the European Framework of Key Competencies of the European Commission). Funds and goals are determined in the National Strategy on the Digital Agenda for Romania 2020, approved in 2014 and according to the OMENCS 3590/5.04.2016 in the lower secondary school will introduce starting with the 2017-2018 school year a new subject matter on Programming and ICT with an allocation of 1 hour per week.

The adoption and the development of ICT in education

In Italy the introduction of ICT in school education starts with the National Plan for Information Technology (Piano nazionale di Informatica - PNI in Italian). In 1997 - the introduction of school autonomy represents a restart for improvement of ICT in primary and secondary school. The experience of PNI came to an end during the reordering of the school system following the 2010 decrees (Minister Gelmini). The beginning of this experiment coincided with a two-year Teacher Training Plan, initially only involving the two disciplines concerned, and then extended to letters and languages. From 1997 to 2000 the National Plan of Didactic Technologies (PNTD in Italian) was held, the most important initiative that for the first time introduces computer science and telematics in all classes and grades of the school and training for all teachers, with three objectives:

- education of students in multimedia and communication;
- improving the effectiveness of teaching and learning of the disciplines;
- improving the professionalism of teachers.

The Common framework for Teaching Digital Competences in Spain and the Project of Digital Teaching Competence in Catalonia. These frames of reference emphasize the Digital Competences of teachers and their implementation in educational practice. During the last years the figure of the ICT coordinator has appeared for the implementation and the correct use of digital technologies in the educations centers. In the different autonomous communities, the figure is considered differently. The central and regional governments define competences and skills that students must to goal in primary and secondary schools. In Catalonia the TAC Plan runs as a vector for introducing ICT in education and an assessment on implementation.



As said previously there is not a specific institutional strategy in ICT development in education in England and Finland so there is no a specific feedback from the schools or local governments.

Institution, organisational processes and key figures

As already mentioned above, there are some differences in the organization of education among the countries of the DECODE project. For example, Finland and England have not a centralized way of skill's growth in ICT among the teachers and all is delegated to a singular school budget and/or to the parents contribution (specially England) or joint municipal boards (Finland). In Italy, the Guidelines for the implementation of the PNTD 1997/2000 provide, in addition to the financing of general projects for the allocation of funds for the implementation of more than 11 pilot projects, engaging a limited number of schools, to have organizational methods and particular solutions and types of specific verification, starting with a series of ongoing or concomitant activation.

In Spain and Catalonia the local and general Government introduces and implements ICT in the classroom through the definition of basic digital competences (LOMCE 2013), specific for primary and secondary compulsory school. In Romania, the National Education Law defines the training profile of the graduate of compulsory education and explicitly target the developing of the digital skills. Furthermore, the Ministry of Education encourages schools and educational institutions to promote educational projects and partnerships with different companies.

Furthermore in Finland, a national agency is responsible for the implementation of the policy aims.

Table 1 shows this separation of competences:

Two-tier national administration

| Ministry of Education and Culture | Finnish National Agency for Education |
|---|--|
| <ul style="list-style-type: none"> • Education policy • Preparation of legislation • State funding | <ul style="list-style-type: none"> • National development agency • National core curricula & qualification requirements • Support for evidence-based policy-making • Services for learners |

Then, in England, the Department of Education is supported by several agencies including:

- Ofsted - This is a non-ministerial department of the UK Government with the responsibility for inspecting educational institutions in England
- Ofqual - this is the Office of Qualifications and Examinations Regulation which deals with examinations, qualifications and assessment in England
- Education and Skills Funding Agency – deals with funding for education and training for children, young people and adults



- Standards and Testing Agency - this organisation sets the tests to assess children in education from early years to the end of Key Stage 2 (age 11)
- Higher Education Funding Council for England - this organisation is responsible for the distribution of funding to universities and colleges of Further Education in England

The Department has responsibility for primary, secondary and further education but at local level, the Local Education Authorities (LEAs) are responsible for setting in place educational policies. This is similar to Finland in which Local administration is the responsibility of local authorities.

The Italian key institutional figures framework is focus on training courses in order to encourage the use of ICT in classroom: operative program of training is ForTic Plan (National Information and Communication Technologies Teacher Training Plan, 2002), a broader scope project launched at the end of 2002, involving about 180,000 teachers supported by approximately 8500 tutors. ICT's training is often considered a collateral step than a core business of teachers preparation.

Financing projects supporting innovative didactic approaches based on ICT

| Fund for ICT | England | Italy | Finland | Romania | Spain |
|---------------------------|---------|-------|---------|---------|-------|
| State | | x | x | x | x |
| Regional or local | | | | | x |
| European | | | x | | x |
| International institution | | | | x | |
| Private | x | | | x | |

In Italy, by Ministerial Decree 851 of the 27th October 2015, the new PNSD (National Digital School Plan - Piano nazionale Scuola Digitale in Italian) was launched, which provides for the period 2015/2020 over one billion euros of investment. The overall challenge of the whole project, articulated in 35 operations, is of a cultural nature. The initiative is not complete and conclusions will soon be drawn and judgements made. A lack of governance by central administration discourage to make an assessment during the course of work.

In Finland a Government Programme, provides 90 million euros to execute a three years plan. Of these resources, around 8 million euros were made available in autumn 2016 through the Finnish National Board of Education for activities relating to experimenting, development and innovation, and roughly 7.5 million euros will be disbursed for training and activities for tutor teachers.

In Romania funds for innovation come either from specific programs of international organizations (i.e. World Bank) as well as from specific contributions of companies (i.e. Orange a telecom company).

In Spain during the last decade of the twentieth century and the first decade of the XXI, regional educational policies to integrate ICT in schools were raised and implemented without there being shared objectives or actions between regional governments; these were policies that followed European directives but were partly funded by the European Union. Also a drive resource and guidelines for ICT learning in Spain is the PNTIC (Programa



Nacional de Tecnologías de la Información y la Comunicación, in English: National Program of Information and Communication Technologies).

1.2. Contractual framework

As for other aspects of school's life, the contractual frameworks of the analysed countries present many differences. In Finland and Italy the Labor Unions have a specific role in definitions of works conditions in respective countries, the professional profile of the Italian teacher -in example - is described in the National Labour Contract for Teaching Staff and his duty is guaranteed by Constitutional Charts. In England there are differences in salary between different types of schools.

Career perspective for school leaders and teachers and the framework of professional competences

In Italy in 2015, Law 107 states that the school leader can identify, within the scope of self-employment, up to 10% of teachers who support Headmaster in organizational and educational support activities of the school institution, as well as other teachers who will receive assignments from the school manager. A Master's degree is necessary to attend in any schools level and field of teaching.

In Finland class teachers have a Master's degree in education. Subject teachers have completed a Master's degree in the subject they teach as well as pedagogical studies. Teachers are required to participate in in-service training every year as part of their agreement on salaries and in Finland, teaching career is highly valued, selection is hard: 10% of applicants become class teacher and between 10 and 50% subject teacher (depending by field).

In England (and Wales) if you have a degree, you can train through a postgraduate teacher training course. There are 2 main routes to take this achievement: school-led and university-led. Both provide you with the practical skills and theoretical knowledge needed for teaching, but are delivered differently. For those who don't have a degree, they can qualify by taking a Higher Education course that awards qualified teacher status (QTS).

Assessment and Quality Assurance Systems

In Italy the 107 law (La Buona Scuola) of 2015 introduces the valorisation of the profession, entrusting the School Manager with the choice of professors to be rewarded with a bonus on the basis of three dimensions to be rejected in criteria by a three-year evaluation committee, consisting of the chairman, who presides over it, three faculty members, two of whom are chosen by the college one by the board of directors, two parents or one student and one parent chosen by the board of directors, an external member identified by the USR among teachers, executives and inspectors. A budget for merit of 200 millions of Euro was destined in 2016.

In Finland key of evaluation of quality is autoevaluation. School inspections were abolished in the early 1990s and the education providers receive their own results to be used only for development purposes.



In England checking of quality in teaching and specially in ICT confidence is lead directly by single school and ICT coordinator for digital competences. At the start of every year all staff were surveyed on their confidence in using ICT within the classroom. Goal of this survey is having 90+% of staff respond that they now have good skills for using technology in education delivery.

In Romania there are no currently any specific regulation for the Assessment and Quality Assurance of integration of ICT in Education. Within each school there function several committees, on of the most important being the Quality Assurance and Evaluation Committee.

1.3. Teaching digital skills

Experiences in the field of training teachers' digital skills

The DECODE partners present in the national reports the following main and most interesting experiences in the field of training teachers' digital skills.

The English research team presents four projects:

- JISC - Building Digital Capability (<https://www.jisc.ac.uk/rd/projects/building-digital-capability>)
- NAACE ICT Mark (<https://www.naace.co.uk/school-improvement/ict-mark/>)
- Education ICT Conference (<https://enhancingeducationtech.co.uk/>)
- Blended Learning Consortium (<http://www.blc-fe.org/>)

Regarding digital capabilities, JISC - Building Digital Capability. Building capability for new digital leadership, pedagogy and efficiency - developed a framework, which is now often used by digital leaders in their work. The framework describes the skills needed by staff from a wide range of academic settings to perform well in a digital environment. The project deals with the use of digital technology in the field of learning. It has developed a set of elements, which enable staff to provide a better learning environment for students, which in turn can lead to a better return on the investment put in to digital technology by the university or college.

The framework has 6 elements: ICT Proficiency/ICT Productivity (Functional Skills); Information, data and media literacies (Critical Use); Digital creation, problem solving and innovation (Creative Production); Digital communication, collaboration and participation (Participation); Digital learning and development (Development); Digital identity and wellbeing (Self-actualising).

The framework is used to support discussions around the capabilities required in a digital organisation and to plan staff development and review the curriculum using the above elements; it also offer a facility to highlight skills gaps among staff and to plan development accordingly.

Digital capability framework





The project NAACE ICT Mark is an award for schools with good use of technology to support teaching, learning and school administration. This accreditation is awarded to schools for the best use of technology and learning and in the day to day running of the school. The Award is valid for 3 years from date of receipt.

Schools who achieve this award have demonstrated that they are committed to the use of technology for the overall benefit of the school. Among the benefits of a school having the ICT Mark are that parents and the whole

ICT Mark



The award for schools with good use of technology to support teaching, learning and school administration. Derservedly popular with schools wanting to demonstrate both effective and mature use of technology. Schools use this award to drive change and many are, or go on to be, outstanding.

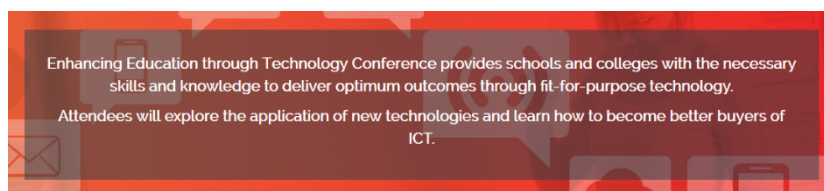
school community will understand the commitment of the school towards technology and showcases the school as a go to hub for technology among its peers.

The NAACE ICT Mark is a way for teachers who use ICT in their day to day teaching across many subject areas to receive the recognition for this. As schools invest more in technology, the ICT Mark allows them to show that they are getting the best value from this investment and the best commitment from school staff.

The Education ICT Conference is an annual conference brings together schools and colleges to learn about the skills needed to make the best use of technology in their institutions. Delegates explore the application of new technologies and how they can buy the best technology to suit their needs.



**ENHANCING EDUCATION
THROUGH TECHNOLOGY 2018**

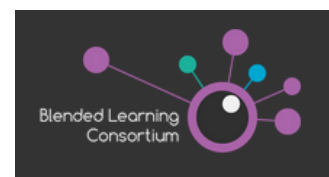


The conference addresses the innovative use of technology enhanced learning in the classroom setting and how teachers can make the best use of this knowledge. Exhibitors meet an audience of over 200, including: headteachers, heads of digital learning, heads of IT, directors of blended learning from organisations such as primary and secondary schools, the Department for Education, Local Education Authorities.

The Blended Learning Consortium was launched in 2015 by the Heart of Worcestershire College to support Further Education Colleges to meet accredited guidelines and to share quality digital/online learning resources for further education. The Heart of Worcestershire College recognised how it was hard to find high quality digital resources targeted to the needs of the further education sector and therefore decided to solve this themselves. Blended Learning is a mixture of traditional classroom methods and online digital methods. The consortium produces learning resources which cover different learning levels and subjects. Colleges in the Consortium can share good practice by contacting other members through discussion forums or by using the blog which has been set up by the project team at the Heart of Worcestershire College. The Blended Learning Consortium was set up to offer a solution to providing face to face contact time for 100% of a course which was proving difficult due to budget reductions.



The Blended Learning Consortium focuses on the effective use of digital technology in further education institutions and the sharing of knowledge between staff members. The result of this collaboration is high quality digital resources, which are developed for the further education curriculum. Quality support is provided for the development of staff members' digital capabilities; they can develop their skills to produce content, which can be cascaded across the Blending Learning Consortium network.



Blended Learning Consortium

High quality shared resources specifically developed for the FE curriculum.



In Romania the teacher training system includes:

- initial teacher training which is done through either the Departments for teacher training from each university organizing the pedagogical module. The curriculum of the module includes 6 semester courses, one of them being Computer Assisted Instruction. Due to the university autonomy, there is no clear or uniform structure of the module, respectively of the Computer Assisted Instruction course. The main topics covered on this course could include: potential of ICT for learning, approaches to ICT based learning, ICT based education tools and methods or through the Didactical Master programme;
- continuous teacher training run through the Teacher Training County Centres. According to the official provisions each teacher is obliged to acquire a minimum number of 90 professional development credits within a period of 5 years. Failing to do this can hinder teachers possibility of promotion, professional stimulants etc.

The Romanian research team presents several good practices that were highlighted by participants during the interviews and focus groups. They are local, national and transnational initiatives or online resource hubs. With particular reference to the development of teachers' competences, the aims of these practices are different:

- to improve access to broadband internet and the ICT infrastructure in rural and small urban areas, as well as the acquisition of ICT skills;
- to improve access and participation to initial and continuous training opportunities for teachers;
- to develop abilities of teachers to use interactive teaching methods and ICT;
- to expand the skills of primary school teachers in order to match the requirements of the new curriculum;
- to develop digital resources for teaching;
- to equip maths teachers to develop and implement curricular activities while using ICT resources;
- to train teaching staff to acquire the digital competences that make up the e-skills for the 21st century and enabling them to implement modern teaching methods and strategies that make use of tablets;
- to promote the use of mobile devices in teaching;
- to promote the teaching/learning of elements related to ICT, technology, maths, programming and engineering;



- to create and promote the implementation of a curriculum on programming for the lower secondary cycle at county level;
- to improve the quality of education by developing the capacity of schools to build key competences in the areas of maths, sciences and technologies;
- to develop and implement digital tools for improving the evaluation and self-evaluation in upper-secondary education;
- to create an e-learning platform for a wide range of subjects within the national curriculum;
- to create an online community for sharing tools and experiences related to K-12 education;
- to promote and support a Europe-wide collaboration among STEM (science, technology, engineering and maths) teachers, education researchers, policymakers and other STEM education professionals.

The Spanish research team presents in its report the Common Framework for Teacher Digital Competence. An Institute of the Ministry of Education, the INTEF (Instituto Nacional de Tecnologías Educativas y de Formación del Profesorado), created in 2012 this common framework, based on DigComp. It is used as a base for planning teacher Professional Development programmes, such as MOOC, NOOCS and other digital resources (European Commission, 2017).

In 2013, the draft version v1.0 was published and, in 2017, the Digital Teacher Competence Framework has been updated to its current version. The "Common Framework of Digital Competence for Teachers 2017" is a standardized proposal that specifies the digital competence through competency descriptors of 21 sub-competencies organized in 6 levels and five areas of competence (INTEF, 2017):

1. Information and information literacy. Identify, locate, retrieve, store, organize and analyse digital information, evaluating its purpose and relevance.
2. Communication and collaboration. Communicate in digital environments, share resources through online tools, connect and collaborate with others through digital tools, interact and participate in communities and networks; Intercultural awareness.
3. Creation of digital content. Create and edit new content (texts, images, videos ...), integrate and re-elaborate previous knowledge and contents, perform artistic productions, multimedia content and computer programming, know how to apply intellectual property rights and use licenses.
4. Security. Personal protection, data protection, digital identity protection, use of security, safe and sustainable use.
5. Problem solving. Identify digital needs and resources, make decisions when choosing the appropriate digital tool, according to the purpose or need, solve conceptual problems through digital means, solve technical problems, use creative technology, upgrade own competence and that of others.

In Spain, in 2015, Extremadura implemented Teachers Digital Competence Portfolio, a document that details and organizes in levels the digital competences necessary for the exercise of teaching in the context of the current society (DOE 112, General Secretariat of Extremadura, 2015).

The Spanish team presents also the Projecte Interdepartamental de Competència Digital Docent (PICDD) (Project of Digital Teaching Competence). It was launched in 2014, with the objective of identifying the digital competences of non-university teachers and establishing the framework and design of the ways for acquiring and accrediting these competences, both in initial training and in in-service teachers (ENS/1356/2016 resolution,



DOGC, 2016). In this project, the initial and continuous training of ICT teachers was analysed in order to make proposals. In this sense, the project defined five areas or dimensions of digital teacher competences:

1. Design, planning and didactic implementation. Ability to select, use and evaluate digital support technologies in the definition and execution of the teaching-learning process, inside and outside the classroom, to optimize the planning and dynamic organization of the experiences, activities and resources planned to guarantee the acquisition of learning and facilitate collaboration and dissemination among the educational community.
2. Organization and management of educational spaces and resources. Ability to organize and manage, in a responsible and sustainable way, the digital technologies in a way that facilitates and/or allows to improve working conditions, both in terms of educational management and didactic level.
3. Communication and collaboration. Knowledge, skills, attitudes, strategies and sensitization required when using digital technologies to communicate, collaborate, create and share content and build knowledge in the framework of the design, implementation or evaluation of an educational action between teachers and the students.
1. Ethics and digital citizenship. Knowledge and assumption of the implications derived from the use of digital technologies in the educational field in terms of legality, security and digital identities. Training of students on these courses as long as they make an ethical and responsible use of these technologies.
2. Professional development. The competences related to the professional development of the teacher have to reflect on their professional practice, in relation to the educational challenges posed by today's society; As well as the involvement in virtual educational environments, where it configures its professional digital identity, contributes and disseminates educational resources and is formed on a permanent basis.

In Italy, like in the other countries, continuing education is an integral part of the teaching function, but today the Italian law n. 107/2015 (The Good School) recognizes and strengthens this principle, corroborates some rules of operation and gives it financial resources. Three tools have strengthened the awareness that professional development of teachers is crucial for the growth of a quality school: The Triennial Plan for the Training Offer, the School Improvement Plan and the Self-Assessment Report (RAV - Rapporto di Autovalutazione, in Italian).

First, it is the same Law 107/2015, which recognizes that participation in training, with a variety of possible choices, must refer to the school community, specifically in the Triennial Plan of the Training Offer. It should include within it the anticipation of the training actions that the institute undertakes to design and implement for its teachers (and for all staff), in a differentiated form in relation to the needs detected. Secondly, there are tools for linking the systematic design to the training operations within the school to the priorities and the improvement goals of each institute. The Self-Assessment Report (RAV), which each school has created and updated, identifies the goals of improvement that, accordingly, each school community intends to achieve in the next three years. The RAV internal analyses are the starting point for the Improvement Plan and RAV identifies training as one of the 7 process areas on which a judgment is made about the institution and one of the project goals that the school can point and define to achieve the results. The plan of each school must consider staff training as a lever to successfully pursue the Institute's development and improvement strategy.

Mandatory, permanent and structural, three "heavy" adjectives that change the relationship between teachers and the profession, seen here as a constantly evolving process, to be treated according to needs that intertwine, among those of the person who carries out a profession and those who come from the environment.



The Personnel Training Plan, as an act adopted by decree of the Minister of Education, University and Research, defines the priorities and the financial resources for the three-year period 2016-2019 and outlines, starting from the school year 2016-2017 (also taking into account the training initiatives launched in 2015-2016), a strategic framework to support in a transparent, innovative and effective way a concrete policy for the growth of human and professional capital of the school. Between the different objectives of the plan, in the training area, we can find: a. Personal and professional growth goals of the individual teacher; b. School improvement goals; c. Strategy for the development of the entire country.

The Plan is an informative and strategic prerequisite for addressing the theme of career enhancement of teachers. A professional development system allows documenting, through devices such as the professional portfolio - as in the Spanish context - and the professional development plan, the gradual refinement of skills, attitudes and expertise of the faculty to give an overall representation of the teaching function.

According to digitalization in EU, Finnish government made action plan and followed the general lines. One of the strategic priorities is Digitalisation, experimentation and deregulation (procedures). These priorities are materialized in the 26 different key projects. Digitalisation mentioned in followed key projects: public services will be digitalized; a growth environment will be created for digital business operations.

One active key project is in the educational sector (2015 – 2019): New learning environments and digital materials to comprehensive schools. Teacher's ICT skills were developed and supported during projects Ope.fi 1, Ope.fi 2 and Ope.fi 3. Oppiminen online is a part of the "OsaOppi III – Osaamispisteet pelissä" and OsaOppi IV project in which the requisite skill sets, as defined by the Ope.fi standards (in Finnish), are provided over 3 levels and 3 locations around Finland: Espoo, Hämeenlinna and Oulu.

Teachers ICT skills are followed during years 2012 – 2017 by e-platform <http://opeka.fi/fi>. Teachers from basic and general upper secondary schools can give feedback about their skills and competences of ICT using on this self-assessment platform.

The answers will identified skills and competences on the five different groups:

- technological capabilities ('teknologiset valmiudet')
- methods/mode of operation ('toimintatavat')
- attitude ('asennoituminen')
- using in the teaching process ('opetuskäyttö')
- competences ('osaaminen')

The Finnish report presents the results of the survey.

Teachers have progress in some sectors (answers are more positive compared to the earlier years):

- *The devices and software in use work well. ****
- *I have got devices, what I need, from my school. ****
- *The school is using a wireless network, and students and visitors can use the Wifi with their own devices. ****
- *I follow social media networks to learn new.*
- *ICT skills are one topic during development discussions with my leader. ****



- *I have tried graphic or other types of programming with my students. ****
- *Better level of my ICT skills. ****
- *I will receive sufficient technical support to ICT in my school.*
- *Pupils can use their own devices (eg laptops, smartphones, tablets) in their classes. **

Some other answers are less positive compared to the earlier years:

- *Scope of new technology into teaching is a burden. ****
- *Level of using the information and communication technology during my lessons.*
- *I can influence my school to procurement of ICT.*
- *I find good ways to utilize information and communication technologies in different learning situations.*
- *My school has jointly agreed goals for using ICT in teaching. ****
- *I would like to use information and communication technology more in my teaching. ***
- *Students use information and communication technology most of my lessons. ***
- *I can use digital materials in my teaching. **
- *The working atmosphere is positive to experimenting with new things in teaching. **

The school leaders have the other e-platform for following the digital environments and development needs in their schools (self-assessment tool <http://ropeka.fi/fi>). Answers will identify followed sectors:

- strategy ('strategia')
- commitment to the change ('sitoutuminen muutokseen')
- developing of the new working culture ('uuden toimintakulttuurin luominen')
- developing of competence ('osaamisen kehittäminen').

Omnia, partner of DECODE, one of the biggest vocational and education training center in Finland, have got own project with specific objectives for the next year. The goal is that learning will be possible in digital environments in cases when the presence learning is not possible. Digital environments will support developing of distance learning, larger cooperation between different education providers and working life, and skills of lifelong learning. For that, Omnia will have decided followed activities:

- Ensure that all students have good digital skills for developing their own skills and working life.
- Ensure that different departments develop specific objectives of digital skills according to their needs in distance learning and using ICT in the teaching.
- Departments and work groups identify their need and form for the digital support according to their objectives to reach the goals.
- Ensure the competence of the personnel, infrastructure and support for ICT.
- Provide more forms of cooperation and identify together of production contents.
- Evaluate effectiveness.

Pedagogical models in teachers' digital skills

The DECODE partners present in the national reports the following main and most interesting pedagogical adopted models in teachers' digital skills.

The Italian research examines in depth how much is important the creation of a continuous professional development system, a "diffused" learning environment qualified by a variety of cultural opportunities for training,



throughout different tools: courses, community practices, journals, publications, associative experiences, research proposals, and academic activities. To achieve the goals associated with an effective decline in training in the field of teaching, the starting point is the adoption of "professional standards". As is the case in many educational systems around the world, it is necessary to link the teacher's continuous professional development goals to clear and defined professional standards.

Through an analysis of the main models proposed at international level and as anticipated by the Italian Ministerial Decree 850/2015, the following areas of professional development will be considered as the starting point:

1. Possession and exercise of the cultural, disciplinary, didactic and methodological competences in relation to the objectives of the competence and the learning objectives envisaged by the school ordinances;
2. Possession and exercise of relational and organizational skills in relation to the best management of teaching and learning environments;
3. Participation in the organization of school, collaborative work on the network, also ensuring coordination and animation functions;
4. Care for their own training in the form of teaching research, documentation, reflection on practices, dissemination of experiences of excellence.

The attainment of adequate standards makes it indispensable to introduce tools that can accompany the career path. The Italian Education Ministry will make an on-line system available in which each teacher will be able to document and reorganize his/her "training and professional history" by building his/her own professional portfolio.

The macro areas on which the plan is based are:

1. Area of expertise related to teaching (didactics): a. design and organize learning situations carefully with the relationship between teaching strategies and disciplinary content; b. use appropriate strategies to personalize learning pathways and involve all students, develop paths and educational environments with personalization and inclusion; c. Observe and evaluate students; d. Evaluate the effectiveness of your teaching.
2. Skills area related to school attendance (organization): e. Working as a peer group and favouring its constitution both within the school and between schools; f. Participate in the management of the school, working in collaboration with the executive and the rest of the school staff; g. Informing and involving parents; h. Contribute to student well-being.
3. Area of skills related to training (professionalism): i. To examine in depth the duties and ethical problems of the profession; j. Maintain continuing education; k. Participate and promote research paths for innovation, also by taking care of documentation and portfolio.

In Italy, the Law 107/2015 identifies some of the priority objectives that, in order to be achieved, require specific actions at national level. They concerns:

- the methodological innovation in all its forms and connects to the new environments for the learning and use of teaching technology;

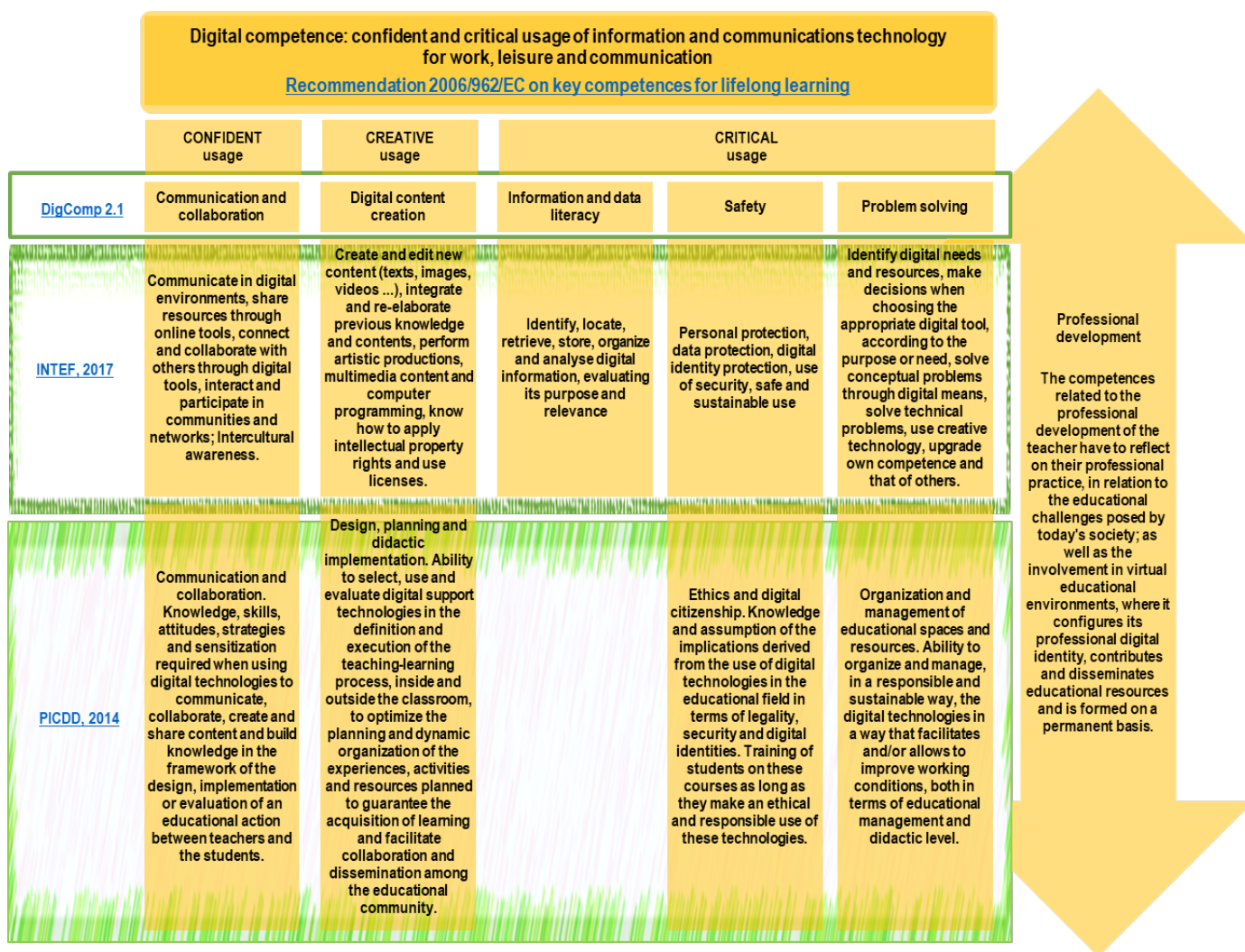


- the study of foreign languages, with the aim of raising the level of language-communicative skills of students, with particular attention to the CLIL methodology;
- opportunities for curricular, organizational and didactic autonomy;
- acceptance, aimed at inclusion, as a "daily" way of managing the classes;
- the culture of evaluation and improvement;
- the school-work alternation and the relationship between school and the outer world

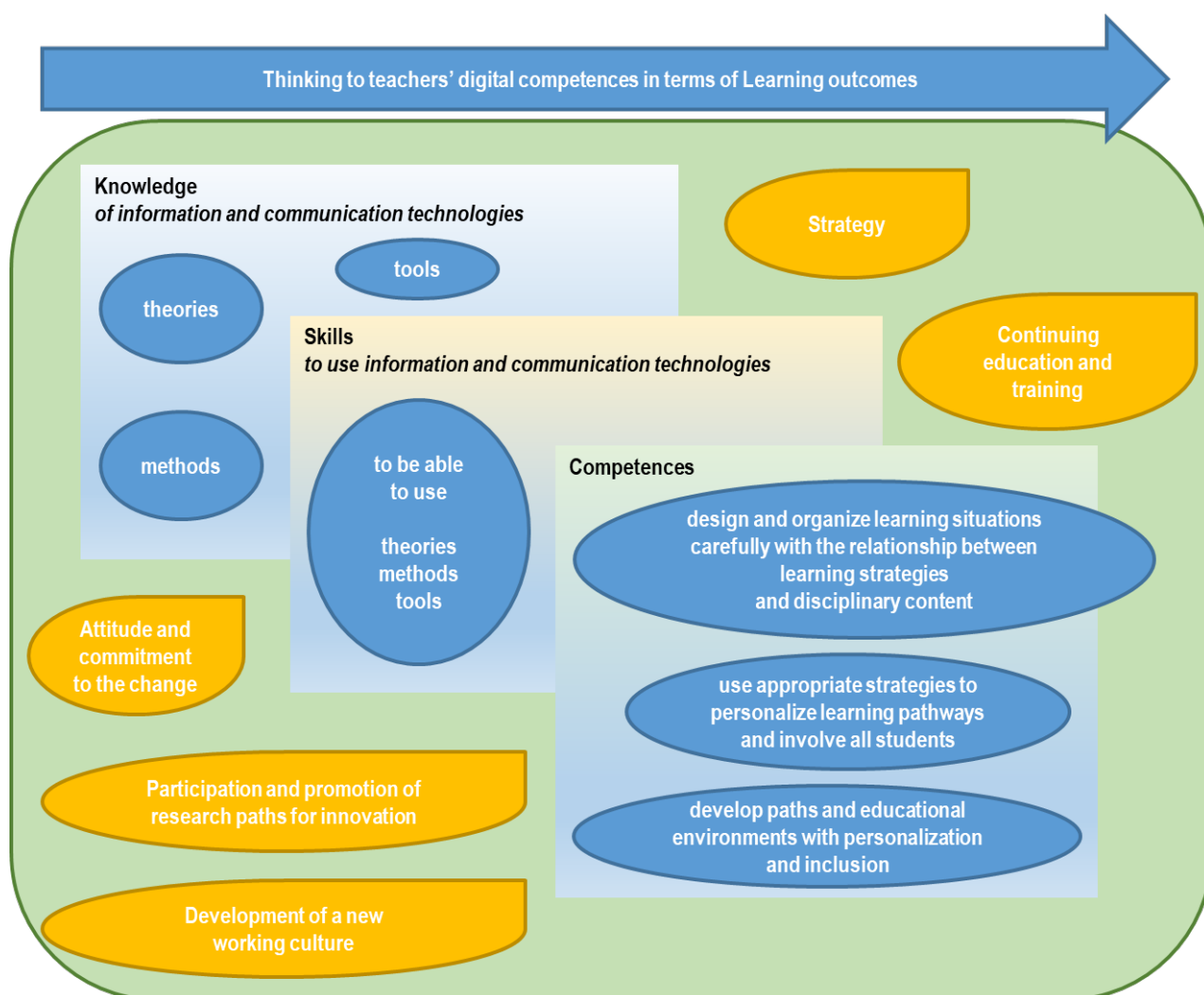
Final considerations

From the analysis of the European and the different national digital competences frameworks, a possible common framework is proposed.

Certainly, it is not exhaustive, but it just represents the common elements of these frameworks, consequent from the results of the national researches.



From the results of the focus group and the interviews and during the progress of the project, the research team can work on some areas of development of teachers' digital competences. They can identified as follows.





2. The national survey results

2.1. The main issues emerging from the focus groups

Introduction

The participants of the Focus Groups have been chosen based on their profile as Headmasters, School directors or managers, ICT experts with extensive professional experience in the ICT and education sector, with the aim of detecting best practice, accompanying needs and coordination for the integration of ICT in teaching practices. Participants discussed about digitalisation, how to distinguish ICT and digitalisation. With some differences between countries, focus groups have shown similar problems and opportunities as far as innovation and change in education systems are concerned.

Innovation and digital revolution

The world is changing, and also learning tools / digital environments are changing. There are new ways and methods of working. It is important to allow all students an equal level of personal training and guidance, and instructors must be able to support them. Online guidance differs from face to face guidance. Shared teaching and driving skills require cooperation and networking. The adoption of digitalisation requires motivation, desire to try and change of mind. It also requires the manager's intent and peer support.

It is crucial to change perspective on innovation. Didactic approach has to be modified, for example in space organisation of classrooms and in choosing didactic methods (face to face lesson can not be the only way). ICTs are tools to help to work in different ways (coding, etc.); didactic approach has to be modify (for example in space organisation of classrooms, in the use of didactic methods - face to face lesson can not be the only way); a pedagogical revolution has to be encouraged: the new approach is learner-centered and not discipline-centered; a different mental and cognitive approach is necessary. Teachers have not to change all the didactics, but they must learn to use ICTs as a helpful tool. From an administrative point of view, using digital tools can help in reviewing traditional procedures.

Innovation needs training for teachers: if the quality of the training paths is poor, teachers move away from the idea of innovation. Innovation is perceived when something is no longer working. For some teachers there is no need for innovation. The paradigm shift occurs through tools: there is no shortage of information as before. Learning is in itself innovation, we are in a process of constant change. The process does involve not only students, but also teachers. If school can promote these attitudes, innovation will come by itself.

It is necessary to be open to innovation, but it is also necessary to active a "pedagogical filter": the use of new communication devices is widespread and there is the need to develop critical skills in order to better know and



discern. It is crucial to deal with communication, both from the user's and from the producer's points of view. Among opportunities for ICT innovation, there is the possibility to create teachers practice communities and networks. It is necessary to oppose the isolation of teachers and adopt a systematic approach.

National education policies in the different countries support the development of pedagogical and methodological innovation through ICT through programs aimed at developing and implementing digital tools and mechanisms.

The majority of participants shared the idea that nowadays the use of ICT technology is relevant and necessary, and thus the promotion of digital skills, but there are also nuances in how to define, focus and address this digital or technological competence.

Many participants of the focus group have cited digital competence, and have considered it a competence with its own entity, and in the other hand, many of them consider it a transversal competence, because it relates to critical thinking in the global world, civility, interaction and communication.

To innovate means knowing how to select, configure and program digital devices according to the tasks to be performed; to critically differentiate which digital devices have to be used according to the needs of the task, moment and situation, so people must be digitally literate, to know how to use different software and applications, configure cloud computing spaces, elaborate and manage digital documents, or image and sound editing.

To innovate means knowing how to search, contrast and select digital information suitable for the work to be done, all considering different sources and digital media; to be able to define and apply accurate search criteria, and knowing how to use search engines; to have a critical vision of the information found and discriminate useful information and contrast it with several sources in order to verificate its pertinence; to organise and use a personal work environment and learning with digital tools to become profigate in the knowledge society.

To innovate means knowing how to participate in interpersonal communication environments and virtual spaces; to acquire communication skills and strategies to interact online with others and to develop criteria that allow them to share the adequate information considering the space in which will be published such as social networks.

To innovate means knowing how to be aware of the civic dimension of the use of technology; to respect a code of conduct in being active online; to use responsibly and ethically the digital resources; to be aware of benefits and risks of using ICT for personal development.

It is needed to integrate technology in all aspects of life, but this integration, as can be seen in the description of the digital competence, is not enough by itself and has to be accompanied by critical thinking.

Regarding the role of the school in the promotion of the emerging teacher skills in digital era, many participants said that despite the fact that society is increasingly aware of the need for change and educational transformation to respond the current demands and needs, the school continues to be linked to obsolete and decontextualized practices that are distant from the development of the competencies cited.



New competences required

Good practices are facilitated by followed arguments: good cloud services, sharing between teachers, presence of digital tutors, program for digi-tutor, organizing e-tests, development of technique; communicate and share information.

The limits are reinforced by followed factors: attitude, social media not involved in teaching process (not appreciated as teaching method), age limit (primary school), not enough equipment, poor digital teaching material, poor sharing; not enough equipment (have to organize paper test), problem in networking, pupil's equipment, changes in study programs, limited skills of pupils, limited skills of teachers, programming skills, licenses from parents, limited financial resources (big difference between towns and countryside, and between different areas), limited time for training; strictly theoretical, not related to actual needs or poor quality training courses (there is a need for several such courses of methodical training with embedded practice).

The management of school have an important role by trying to remove restraining and limiting factors. Some bureaucracy such as teaching obligation, pay system can limit to real motivation: it would be good to get more relaxed hands for those who want to do more.

The followed skills was named during interviews: socio-relational skills, sharing skills, networking skills, interactive skills, curious and entrepreneurial attitude; digital skills such as basic ICT skills, user skills for digital devices, skills for digital conversation, digital literacy, skills in data sources, making visual presentations, digital portfolios etc; methodological skills such as to develop digital material (not only copy the books to the e-platform), manage copyright, ownership of digital material (ownership), permissions, skills to use existing digital material.

It is interesting to note that when innovative practices are mentioned it have been cited projects, as well as Apps or initiatives. Practices are innovative when they amplify the possibilities and opportunities of learning of the students, generating more enriched scenarios where the students acquire a leading role. Many participants mentioned spaces of interaction and collaborative construction of knowledge; learning as a social fact, real and contextualized. In these practices the evaluation goes beyond the simple qualification and it is part of the student's learning process, becoming authentic and formative. Innovative practices are all those methodologies that place the student in a network as subject and object of the teaching and learning process. ICT play an important role in these innovative practices as they break the space-time barriers; bring people closer together and boost their collaboration; allow people to go beyond the walls of the classroom and connect with students' real life experiences, and act as facilitators of learning and as enablers of knowledge creation.

In many centers, the use of mobile phones is totally prohibited, although there are national documents that recommend its use. Participants complain about the lack of connectivity, lack of devices, malfunctioning devices, and banning of personal devices when there are examples that the BYOD model can be a valid model at certain times.

School can seen as a complex and resilient organisation and it is necessary to consider ICTs in education practice. School prevents this kind of changes. Some tools or practices are temporary and school cannot change



constantly on their basis. Needs have to be oriented: it does exist a necessity to give answer to needs, but it is important to solicit needs, too.

There is the need to systematize practices and disseminate more about what is done. The danger is that there is no recognition of an innovative potential in these practices, if they are not seen in a systematic approach.

Professional development

Participants have cited a multitude of ways of teachers' professional development. Teachers can update permanently, by carrying out innovative methods and tools in the workplace, participating in professional networking groups, attending courses and conferences, reading the news of the areas of interest, collaborating with colleagues and peers, learning from the students, incorporating new resources of teaching practice, designing training actions. Another way to update professionally mostly recognised by the participants is through being active online and in virtual groups, seen as valuable for professional updating.

Most of the participants share the idea that the formations consisted basically of formal courses and that today the use of ICT expands these possibilities, because nowadays there is a set of context configurations composed of activities, materials, resources and relationships that are generated in physical or virtual spaces and that provide learning opportunities and allow us to study the mechanisms of development and professional updating of different types of professionals. Many participants cited interesting spaces for professional teacher development outside the classroom such as conferences, face-to-face courses, online, meetings or associations. Several participants cited the MOOC courses offered by prestigious institutions from around the world.

There are often important limitations depending on the context: teachers will have more or less possibilities to do a teaching with an intensive use of ICT, there are centers that have integrated ICT in their educational project and have an adequate infrastructure and, instead, there are other centers that do not have Internet connection, wifi, digital whiteboards etc. Even for schools where budget is more limited, the principle of offering staff Continuing Professional Development (CPD) is a core principle. Training specifically focussed on digital skills can be integrated into established training programmes, helping to maximise reach and impact. A lack of coordination and policy on a national level means that it is left to individual schools to decide the level of digitalisation they adopt. Therefore, the uptake and integration of digital learning is reliant on the commitment and vision of individual school leaders.

Individual institutions are given the freedom to address the specific needs of their learners in an innovative way. This has led to a number of effective solutions being developed which are both cost and time efficient. But whilst many schools now encourage students to use tablets in the classroom, these tablets have to be rented from the school at a cost to their parents (as in UK). For some this cost is unworkable, whilst the lack of a national campaign around the benefits of digital learning mean other parents resent being asked to pay. Schools recognise the benefits and savings which can be made by sharing insights and learning from each other. Therefore, these innovative practices are beginning to spread from institution to institution organically, as each shares their learning points and best practices. Some schools are leading the adoption of digital tools (including staff training), whilst others keep faith with traditional methods.



Another risk is the unwillingness of some staff to learn the new skills needed to fully exploit the potential of digital learning. Across the national survey it was clear that it was individual staff attitudes, rather than age, subject area etc. which influenced this.

Teachers want to be trained to work with actual digital resource databases and integrate those things and see examples of good practice. Training courses offered are of variable quality and their lessons are less attractive. Courses should be more interactive.

According to several participants, the training and accreditation of digital competences must also be transversal to teaching pedagogical competences. The teachers must be able to use ICT appropriately in all areas of their knowledge.

Most of the participants pointed out that it is crucial to have fundings. International programs facilitating the exchange of experience for teachers are considered very important for acquiring the necessary skills and represent a way to import good practices in the field of ICT integration. Training in projects such as Erasmus are not always accessible to all the people involved and they really would facilitate a change of mentality.

The EU has an impact on the level of planning. Education policy has helped. Funding from projects to acquire tools for schools - has been a fierce development over the last three years. Distance learning and the use of video tutorials (self-made & network-ready videos) has also been added. This has also increased the networking of teachers during the developing process sharing between teachers.

The key projects of different governments give opportunity to apply projects and financing for further developing and updating digital competences. There are many processes going (new curricula), and teachers understand the need of further training and updating their skills. Projects give possibilities to organise further training of teachers and up-to-date some hardware.

Digitalisation is one of the strategic priorities in all the countries involved. This means opportunity to apply different project and funding for developing digitalisation. In education sector, Governments have also many programs for reforming education and developing new learning environments and digital materials to different level of schools. The aim is to modernize learning, organize more personal pathways for students, make deeper cooperation with labor market, build connections between different levels of education.

Pedagogical issues

The 21st century key competences are mostly described on general level. The difference of ICT skills and digital skills is not very clear for users.

Participants recognize that young generations have different devices (smartphone, tablet etc.) and these devices are not used for training purposes and also not for training of working life basic user skills. Even common ICT skills (eg. Word documents, Excel counting) may be lost. The general opinion was that identification of the twenty first century competences for citizen was described or understood on general level.



School directors pointed out the needs of ICT user skills on the general level. Kindergartens and primary schools have challenges to offer and guarantee the general user skills of ICT. All citizens will need basic skills to manage e-documents. Digitalisation of the society will influence the ways people study, work, have leisure and communicate. People will need new skills to manage confidential and ethical information.

The competences of the twenty-first century citizens that schools can help develop through the integration of ICT named during focus group were the following: all key competences of Lifelong Learning (both written and oral), problem solving, team working, multi-reading skills and digital literacy, text and image literacy, critical evaluation of data sources, interpreting images and videos, mode of operation by sustainable development, integration and enhancement ICT in educational settings and teaching processes, problem solving, team working, basic skills in ICT.

Participants mentioned other soft skills that will support digital competences and/or are connected to twenty-first century skills. Primary skill would be learning to learn larger and deeper, also in ICT field. Schools can teach and advise practically all key competences (working life skills, safety using of digital material etc.).

Digital competences will support soft skills such as networking, project work and structured working, and help students by organizing their skills. This will increase students' self-awareness and self-assessment. Networking and team working skills are mentioned often as working life new needs and these have to be taught and trained in schools. Youngsters get accustomed with new equipment and programs much faster compared to adult population and we require them to adapt with new challenges (networking and sharing information by legal principles and ethical rules). In reality, these skills need to be taught and trained also for better managing networking and the creation of public images and profiles.

There is a consensus on the fact that teachers should put all competences into play in educational practice and be able to be constantly learning in order to improve their professional activity and evolve according to social needs. The following key competences are needed for citizenship and the labor market: information retrieval and processing, digital literacy (critical thinking and problem solving, self-expression, online publications, digital portfolio), digital skills and creativity (images, videos, visual presentations).

Governments in different countries pointed out the integration as one of the successful methods to benefit the digitalization in schools. Benefit is understood as answering to skills demanded in the labor market and described in the requirements of curricula and qualifications (digital literacy, critical evaluation of data sources, interpreting images, photos and videos, legal and ethical decisions). Digitalisation would also support developing of language skills, benefit and integrate language through gaming.

Not all experts agree with using digital methods or setting against digital and more traditional ways of studying. Fast development of information technology and constantly coming new can be confusing. There is a need for guidance where it is worth accompanying. New devices and methods (eg. online publications) can cause fear and require re-learning from the old methods.

The understanding of digital skills can connect to lifelong learning skills and support lifelong learning as well distance learning. The computer belongs to the everyday life in every school. In general education, mobile



devices have been used, for example, in information retrieval, in connection with a task (mind map). The hardware is generally not so good, in all the countries. It is crucial to focus on the pedagogical perspective of changing the methods and choosing new tools and materials (BYOD, etc.).

The new situation and new hardware cause many questions and new challenges in schools. Nowadays all teachers and students are going from computers (static working place) to laptops (taking with). Ideal situation will be, when the platform is accessible and it is not dependent on the equipment. Participants pointed out that the learning comes first and the technology is just a tool for learning.

The followed pedagogical aspects were named during interviews: accessibility of teaching and guiding; support to distance learning, more material, videos; developing of lifelong learning (free digital lectures support lifelong learning); developing platforms more user friendly, using based on aims, tasks and sectors; integration of digital methods and materials in learning processes; e-learning; cooperation and networking between teachers of own sector; international projects and learn from each other.

Digitalisation offers also new opportunities against exclusion. Many of the participants are worried about inequality of the students on the level of digitalization: some learners are in top and others down, background of learners either supports or is not favorable to develop digital skills. The challenge will be to get all learners involved. The most important aspect of digitalisation would be that the material should always be available and shared to everyone.

All participants mentioned problems with network errors and updating of equipment. The level in using digital devices and methods depend on: level of equipment, level of users skills, level of working guarantee (updating of equipment and programs/platforms, working of networks); level of software (which programs, platforms, games etc will be used); level of tasks (why teacher choose such kind of methods, platforms and equipment). The level of transfer of these good practices is different from one country to another, but in all countries there are different possibilities between different schools and regions.

The main competences that teachers should have in order to carry on the effective practices are deeply connected to attitude and motivation, genuine desire to develop and share knowledge and materials. The best and effective practices in integration of ICT require time, examples, peer support, learning and experimentation, planned training, equipment and software. Teachers in all countries have mostly basic user level skill of ICT. Compared to number of existing learning platform there is too little training.

Skills in the digital age should include those related to attitudes when using technology: technologies must be used responsibly and efficiently as a means of communication and interaction and a proactive attitude towards networking is needed. Regarding the educational environment, instrumental digital competencies can be separated from methodological ones. The aim is to promote meaningful student learning through student-centered strategies, and to give support to the learning needs of students respecting the different rhythms in the focus of digital content.

Preparing the students for these competencies implies changes at different levels: organizational, spatial, architectural methodological and technological.



It would be useful to plan gradual changes that do not have a lot of risk, that will expand the comfort zone of the teaching staff, that bring good results, that give confidence and that motivate them to continue online. It is necessary to separate the ICT coordinators from the ones responsible for maintenance. It is necessary to consolidate the relevance of the ICT coordinator as a catalyst for innovation and the necessary commitment to a methodological change of teaching staff, as well as the renewal of educational methodologies to strengthen the didactic use of ICT. The leadership of the management teams is also fundamental so that the schools improve the digital competence of teachers and consequently increase their use in schools and reach the students.

Best Practices

NAACE ICT Mark (United Kingdom)

Name: NAACE ICT Mark

Promoter and partners: NAACE, Registered Charity (The National Association for all those interested in technology in education)

Description: This accreditation is awarded to schools for the best use of technology and learning and in the day to day running of the school. NAACE is the national association for those who are interested in technology in education. Schools who achieve this award have demonstrated that they are committed to the use of technology for the overall benefit of the school. Among the benefits of a school having the ICT Mark are that parents and the whole school community will understand the commitment of the school towards technology and showcases the school as a go to hub for technology among its peers.

Aims: The NAACE ICT Mark is a way for teachers who use ICT in their day to day teaching across many subject areas to receive the recognition for this. As schools invest more in technology, the ICT Mark allows them to show that they are getting the best value from this investment and the best commitment from school staff

Resources used: The cost to UK schools (which includes assessment, moderation and receiving of the Award) is £550 for primary schools and £650 for secondary schools. The Award is valid for 3 years from date of receipt.

Results: Schools complete a self-review framework before applying for the ICT Mark (an overview of the way technology is used in a structured way in the school). After the evidence from the self-review has been checked, they will be contacted by an ICT Mark assessor to arrange a suitable date for a visit. NAACE has developed a range of courses to help school staff to complete the self-review framework.

Additional information: <https://www.naace.co.uk/school-improvement/ict-mark/>

ICOS (Romania)

Name: Organizarea interdisciplinară a ofertelor de învățare pentru formarea competențelor cheie la școlarii din clasele I-IV - program de formare continuă de tip “blended learning” pentru cadrele didactice din învățământul primar [Organising in an interdisciplinary manner the teaching opportunities for developing key competences for 1st to 4th grade pupils – “blended learning” continuous training programme for primary school teachers]



Promoter and partners: Ministry of Education, University of Bucharest, Teacher Training Centres, Softwin

Aims: Expanding the skills of primary school teachers in order to match the requirements of the new curriculum.

Resources used: The European Social Fund

Results: Training of over 18000 primary school teachers in the use of ICT in teaching practices.

Additional information: <http://portal.icos-edu.ro/>

Mobilitzem la Informàtica (Spain)

Name: "Mobilitzem la Informàtica (Mobilise computing)" experience, for the optative course in "Informatics" of 4 of ESO.

Promoter and partners: Departament d'Ensenyament (programa mSchools), Mobile World Capital Generalitat de Catalunya, Ajuntament de Barcelona, GSMA.

Description: The project consists on the design and programming of an APP for mobile devices. The students work in groups of 5, and throughout the course the use of different tools and applications is considered. The course is structured with the following parts: Multimedia Creations, Publication and dissemination of contents, and Tools for communication.

Aims: The thread of this didactic proposal is the approach of a project that works in groups, focused on the design and programming of an app for mobile devices. Throughout the process different tools and applications are used, in a well contextualized and guided way, until reaching the final product. Therefore, the integration of ICT in this proposal is quite relevant, in addition to working in a very wide range of skills. It is a very complete experience because it is necessary to learn the use of necessary tools such as audio and video processing, website creation, APPs programming language, economics and marketing concepts, cinematographic script, security and digital attitude, and ethical code in the use of the TIC.

Additional Information: <http://alexandria.xtec.cat/mod/data/view.php?d=2&rid=1773>

Schoolkit (Italy)

Name: Schoolkit

Promoter and partners: MIUR - Ministero dell'Istruzione, dell'Università e della Ricerca.

Description: MIUR, in support of the dissemination of the new PNSD (National Digital School Plan), has introduced the concept of Schoolkit or mini-models and models to help executives and teachers design and develop innovative practices in response to the actions contained in the PNSD. A Schoolkit is a model of instruction to support leaders, teachers, and the whole school community in developing innovative practices, or in designing and implementing the actions of the National Digital School Plan. Schoolkit wants to be a guide, a flexible tool, an example for schools, whose content is not, of course, prescriptive. New Schoolkits can be proposed by teachers, school staff, public and private institutions and institutions as long as they meet the



characteristics defined by MIUR. Schoolkit involve all those who have a shared practice that schools can benefit from, and who intend to put together the shared format.

Aims: The main objectives of the Schoolkits are: to accompany schools in the implementation of the National Digital School Plan; to answer a clear question and help solve a problem or develop an innovative practice. Schools and organizations can request the Schoolkit through the website <http://schoolkit.istruzione.it/>. This platform is to be considered as an always open process for collecting and producing the best practices for innovation in the school.

Additional Information: <http://schoolkit.istruzione.it>

2.2. Deepening interviews

Introduction

In all the five project countries, the interviews with key actors aimed to reconstruct the institutional process regarding the challenges that ICT puts into the school system.

The interviews were conducted using the template shared with the partners, during the IO1 implementation.

The topics addressed during the interview focus around seven central issues:

- the most important challenges faced by the national education system;
- the theme of skills to teach in the digital age;
- the presence of good practices;
- education policies and areas of major investment;
- European guidelines;
- the most important problems encountered in digital development processes at school;
- the most important changes detected.

European recommendations and current national policies

Finland - On the local level the European processes are not so known. The objectives should meet on paper at least in the curricula. There is no national criteria, anyhow, for the digital competence of the citizens or of the teachers. Usually EU recommendations are followed quite punctually in Finland, but in education the situation is a bit different. For example, Finland joined The European Qualifications Framework (EQF) system only recently.

Romania - Both policy makers and decision makers from national and local institutions as well as school directors and coordinators working on ICT integration agree that the current national policies are in line with the European recommendations.



The interviewees were aware of EU recommendations on the topic of key competencies (European Framework on Key Competencies for Lifelong Learning). The opportunity term, in accord with European recommendations, to develop teacher competences in ICT, implies:

- adaptability to modern technique;
- concern for learning and continuing professional performance;
- communicating on the principle to know, to know to do and know to do with others;
- be able to creatively use the scientific content at the class and boost creativity among students;
- has correctly knowledge by point of view scientifically;
- being able to teach the children to learn in the team;
- being able to make students learn and participate with pleasure in school activities;
- knowing how to handle the information;
- being able to communicate in digital format;
- being able to create educational content in digital format;
- managing the administrative system in digital content;
- managing systems on educational content;
- using digital equipment in education;
- observing the ethical and legal norms imposed by digital deontology.

Policies related to the Digital Agenda in Italy are in line with European programs. Among the most important intervention lines, which are also of interest to the school, are the National Broadband Plan and the Digital Growth Plan, which are two synergic strategies for pursuing the goals of the European Digital Agenda 2020. Another important objective, which the Italian PA is investing in, in line with the European dictum, refers to the definition of a framework of digital skills for orienting the systems.

National policies for ICT and innovating education

Results of the national researches highlight some “lacks” and some “requirements” in the design and implementation of the national policies for ICT and innovating education in the partner countries.

Lack of a national framework

In Romania, although the national legislative framework for the adoption and the development of ICTs in education fulfils the necessary supporting role by acknowledging, affirming and encouraging the integration of digital skills, it still requires further improvements in certain respects and coverage of gaps. A focus on monitoring of the sustainability of various initiatives should be a priority.

Nonetheless, the lack of a national framework is also acting as an opportunity in those schools and colleges where digital teaching and skills have been embraced. Rather than having to follow generic national policy or expectations, individual institutions are given the freedom to address the specific needs of their learners in an innovative way. In England, this has led to a number of effective solutions being developed which are both cost and time efficient. These innovative practices are beginning to spread from institution to institution organically, as each shares their learning points and best practices. This greater collaboration (in particular throughout the growth of academy chains) offers a potential solution to the patchy adoption of digital technologies within schools, also from an economic point of view (whilst the costs involved in buying in specialist equipment,



employing specialist staff, developing specific training etc. may be too great for individual schools to afford on their own, institutions which are part of academy chains (or equivalent associations) are able to pool resources and so share the investment burden) (England).

Lack of clear educational policies

Policies too broadly focused on certain specific lines (such as the impulse to the integration of mobile technologies in “Mobile learning”) (Spain).

The need of a modern Education Law emerges - consensuated by the whole parliamentary arch -, that necessarily contemplates the implementation of technology as a transversal tool throughout the educational process. Actions, initiatives or educational policies must be thought out setting medium and long term scenario, posing a process of continuous revision (Spain).

The proposal of reaching an educational policy of excellence emerges. It has to take into account the voice of the protagonists, the key actors of the system: teachers, students, families and other social agents involved in the day to day of education. A country that is progressing is a country in which ICTs are part of all walks of life, including politics and education. It is important to encourage good practices, not necessarily in an economic way, and encourage professional exchanges (Spain).

Lack of national coordination

A lack of national coordination can represent a weakness and also an opportunity. A lack of coordination and policy on a national level means that it is left to individual schools to decide the level of digitalisation they adopt. Therefore, the uptake and integration of digital learning is reliant on the commitment and vision of individual school leaders. Furthermore, even when school leaders want to introduce digital tools, the lack of national promotion and support can limit their abilities to do this (England).

Lack of investments

All national researches underline development of digital tools and skills needs an important investment of money and time.

The educational policies have suffered the economic cuts applied in Spanish and Catalan territory: these cuts and the lack of funding by the governments in the 1x1 programs, have paralyzed or provoked an irregular activity of the educational policies with ICT (Spain).

Lack of time

As well as cost, the development of digital tools and skills needs an investment of time. However, this is not always possible as staff have several other competing tasks and responsibilities to balance. Therefore, they sacrifice spending time on improving their own digital skills, resources used in their teaching etc. in favour of other tasks. Without any overriding national requirements or policy to compel staff to focus on digital teaching and skills, there is no incentive to prioritize this over other tasks (England).



Lack of a firm commitment to turn technology into an ally of the new educational model

Erratic process, which has been improvised without having an integrated project, in which ICT forms part as a transversal support throughout the teaching / learning process. Until recently, the focus was mainly on the availability of technology, mainly devices, in the classroom. Recently the focus has been on devices and has increased in other aspects, such as connectivity, teacher training, availability of digital educational resources, and finally the digital transformation of the educational center (Spain).

Also the Finnish report highlights that, among the interviewees the biggest problem seemed to be the lack of a national vision and strategy concerning the development of ICT competence. Curricula are good but they are quite general and broad based. Principles and education providers have a lot of power to specify them and teachers have pedagogical freedom in the classrooms, so the changes are often fragmented and personalized. The state level works as stated in the government program and the ministry of education is not aware of or even care about the everyday life of the schools. The Finnish National Agency of Education point of view is often that when the guideline has been signed the matter is finished and should somehow be in force immediately, but of course the implementation of the fine decisions takes some time and effort in the local level.

Lack of teacher training, adapted to new learning models

The main limitation is the formal structure and a totally outdated teacher promotion system that rewards seniority. Deep digital literacy is required to acquire a digital teacher composition, both instrumental and pedagogical (ICT + LKT). Working with ICT to do the same that is done with ICT is expensive, incongruent, inefficient and tires the teachers. There's a shared idea that there is a lack of a consistent and regular national or regional plan for forming ICT experts (Spain).

The Finnish report highlights investments to machinery, but not to in-service training. So far the digital competence in the schools has been based on the personal activity of some teachers. Many times the attempts to develop the competence of the teachers has mainly consisted of putting pressure on or even bully teachers, which is wrong.

Also, to minimize discrepancies between schools in terms of human, financial and development resources and opportunities, free educational resources – training courses, platforms, educational softwares - must be provided periodically on a timely basis to teachers, because the work of selecting and purchasing them involves research work and funds which are not at hand for every school (Romania).

Requirement to build networks and “to make system”

The Italian report highlight the most important challenge nowadays is the ability to make a system, build networks, so as to coordinate and promote mutually beneficial fertilization. Today the most important functions of public institutions involved in the digital innovation processes are: the design of system actions; the revision of administrative logic capable of overcoming sectoral perspectives; the definition of the necessary digital framework to which the evaluation topic and the related certifications are to be followed; the promotion of a diffused digital identity/culture capable of expressing a conscious and responsible citizenship. Talking about designing system actions means that public institutions are able to define and to implement addressing and



coordinating actions which are capable of creating territorial and transversal synergies, so as not to disperse human, professional, and economic resources in the field (Italy).

A stronger vision and criteria about the development of ICT in education would facilitate better cooperation. Dialogue between different actors should be increased and build an ecosystem of co-ordinated networks to ensure a minimum level of competences. In Finland, a good example is the network model that National Agency of Education created in a very short time for the training of immigrants (Finland).

Requirement to involve the public administration

The challenge overlaps the educational policy system to invest the whole public administration. Reviewing the administrative logic with regard to the idea of accompanying means overcoming a typically bureaucratic vision based on a policy and sector policy intervention that concludes with the promulgation of the law to understand the strategic importance of accompanying actions and technical assistance for the practical translation of the norm. This means re-orienting the public administration model, to be able to overcome stiff division of departments and territories to foster integrated, multi-level, multi-dimensional policies. This is a radical innovation which invests the way in which programming is planned, with the aim of building alliances with other actors who, in different respects, co-operate on the same goal as the territories, to converge on common goals and priorities. This problem concerns the way of conceiving and writing the calls: the writing of the calls never allows for the provision of accompanying functions and actions; while innovation develops within fertile and reciprocal cultural spaces, it is very important to find the right ways to “cultivate practice communities” (Italy).

Requirement to recognize the value of the capital which students possess

In addition, institutions are recognising the capital, which students possess when it comes to digital skills. They often are far more digital competent than staff, whilst they are also usually far more aware of the latest developments and trends in terms of apps, devices etc. Thus, some schools are beginning to successfully harness this knowledge as part of their digital strategies (this includes involving digital student councils in decisions on technology procurement, as well as appointing particularly knowledgeable students as digital leaders, to help both staff and their fellow students understand how to make the most of the technology available to them) (England).

But, on the other hand, the Finnish report highlights that it is an illusion that pupils could teach teachers. Innovative principals and teachers have developed learning environments a lot, but a firm connection between innovators and other employees is needed. Teachers education, more effective in-service training, and especially updating training of the older teachers, still need investment.

Requirement to improve accessibility and reliability of the ICT tools

There is still a need to upgrade the capacity of the data transfer networks and to improve accessibility and reliability of the ICT tools. If teachers are supposed to use ICT fluently in education, they should have personal laptops or pads paid by employer. Then teachers could play - and learn - with the machines at free time, too. Large contracts demanded by education providers limit the use of open software and can make urge for development awkward and controversial (Finland).



Digital challenges for national education systems

Highlighted digital challenges for national education systems by national researches mainly concern two different levels: the institutional level and the pedagogical one.

The Spanish research team identifies very clearly the relationship between this levels, specifying some needs:

- to update the educational institutions in the new needs of society in the twentieth century;
- to overcome (by all agents) completely outdated structures and dynamics;
- to transform educational processes benefiting from the possibilities offered by technology.

ICTs are indispensable in any educational process, although it is important to know how to integrate them in the educational process; because they have to be facilitators of this change and integrate into learning activities by providing equal added value as they do in other aspects of everyday life, however, they by themselves do not provide a solution to the current school, but it cannot be ignored that without this technology education cannot be given in the times in which we live.

In this direction, two challenges highlighted by Spanish report are:

- the change of educational paradigm “from the industrial society to the network society”;
- fostering competences increasingly needed, such as: critical thinking, problem solving, learning to learn, communication and collaboration, digital and information literacy, local and global digital citizenship;
- the need to move from a teacher-centered pedagogical approach to a student-centered one:
- moving from content to knowledge creation, as technology is the basis in the educational innovation process;
- focusing on dynamic, participatory, collaborative methodologies to take advantage of technology in the classroom in a productive way to improve education;
- and to educate the technology, rather than to technify the classroom, because Society is digital, everyone is connected and needs ICT.

The research team of Romania stresses the challenge for teachers is to learn to transfer what they have learned, rather than learning to use modern means. The education and career systems need deep changes to prepare teachers for digital globalization. One of the conclusions drawn from interviews is to improve the access and participation of teachers in pre-university education, to continuing training opportunities, by developing the capacity to use interactive teaching and learning methods, using ICT. Also, on creating the opportunity to develop a quality education through innovative multi-regional training programs, based on priority areas in education and digital resources. In Romania, teachers have had the opportunity to participate in projects with multi-regional implementation with a transnational approach, and the territorial dimension has covered both urban and rural areas.

About this point, the Italian report explains that compared to the challenges the education system is facing, despite the diversity of perspectives, the interviewees broadly agree on the essential issues that characterize this time of transition and which can be summarized into three main categories which are closely interdependent:

- the first element of attention concerns the infrastructure dimension. All national and international research, as the witnesses recall, underline the Italian gap on this point. A delay that in recent years, with the various interventions implemented in this field, has been attempted to overcome;



- closely related to this issue is the question of technology equipment and its investments, because the ministry has only resources for ordinary management as one of the institutional referrals highlights;
- it is evident therefore that the theme of technologies and infrastructures is closely related to the political one, because it calls for the need to mediate between different interests, needs and visions where perhaps the most weight gains the ability to reconcile logic, rationality, different priority as those that may be of interest to the Department of education and the Ministry of Economy, but also regional calls will to promote and invest in the local development.

From the investment dimension to the educational choices, it is evident that the ability to define the school model, underlying the introduction of digital technologies in the classroom, is very important. The most daring challenge is to define how to help the school to exploit digital technologies for the benefit of training that is capable of forming citizens capable of moving into global and hyper-technology society. The problem goes far beyond the theme of investment in investment, but invests in the crisis of the school-society integration model that requires deep rethinking. Choosing to invest in technology, rather than another issue, raises a process that invests every dimension of the educational process, requiring a radical re-design of architectural structures, spaces, sorts, etc. The problem is not only economic but it recalls the need to renegotiate priorities, disciplines, contents, rules of engagement and, consequently, the type of training that must accompany teachers and students, the skills they deem useful and necessary to form, the way they must and can be constituted and related valuation systems etc.

In this framework, a more complex issue, which traverses the school system, is the need to create a system of certifications capable of recognizing and harmonizing the competence profiles that characterize the digital world. However, the issue of competence certification is an ambiguous and slippery subject, as there is always a risk of stiffening behind the necessary structuring, which leads to the reduction of the margins of flexibility and experimentation, by depriving the autonomy of the school, of teachers and the student's freedom of learning (Italy).

Across the English national research, a common message was that time and financial constraints are the biggest challenges for teachers, when it comes to adopting and developing ICT and digital resources. In recent years school budgets have come under increasing pressure, which means that there is not always the capacity or commitment to do invest in digitisation.

Overall it was apparent that buy-in from senior management was the main driving factor as to whether a school was prepared to free up time and money to invest.

Finally, few people mentioned infrastructure as an issue – high-speed broadband which can support large volumes of users at once is needed but this seems to be an accepted part of modern school life (at least in institutions willing to invest in ICT), and so is something easily rolled out across school sites. Equally, training was not perceived as an insurmountable challenge. Some staff many still require support to improve their digital skills, but the CPD opportunities and support exists. This is largely due to the established commitment to staff development embedded within English education, as digital skills training can be seamlessly slotted into wider training programmes throughout the school year (England).



Problems in implementation process

The English research report identifies investment issues as principal problems in implementation process.

In England, there is no dedicated national funding for the roll-out of digital tools, resources and infrastructure in schools. This produces two main effects:

- each school has to find the money within their own budgets to cover any expenditure of ICT. For many schools, the solution to this has been to pass on some of the cost to parents and pupils. For some this cost is unworkable, whilst the lack of a national campaign around the benefits of digital learning mean other parents resent being asked to pay;
- concerning teachers training, in contexts where money is less of an issue dedicated trainers are being appointed to oversee schools' digital strategies and Continuing Professional Development - CPD for staff; even in schools where budget is more limited, the principle of offering staff CPD is a core principle (both through dedicated training days at the start of school terms and shorter sessions throughout the year). This means that training specifically focused on digital skills can be integrated into established training programmes, helping to maximize their impact.

Connected to investment issues also some pedagogical issues emerges. There is the risk of a “digital inequality”, which can exacerbate social segregation and limiting social mobility. A multi-stream approach is developing across England: some schools are leading the adoption of digital tools (including staff training), whilst others keep faith with traditional methods. As digital aspects become a more integrated part of both education and the world of work, this risks impacting on students' performance and prospects – especially when it comes to the need for well-developed digital literacy skills when they enter the labour market.

For the appropriate integration of ICT in schools, the Romanian research report identifies the following main issues. The main advantages of employing ICT in education include:

- using the ICT resources in education improves the management of school, communication between all actors of education: policy makers, decisions factors, teachers, students, parents and society. It is noted also a growth of education quality, while on the other hand for the motivation for learning.
- Using the ICT in teaching is an appropriate and natural form in which students are trained to integrate into a digital society, providing a major advantage for both, teachers and students.
- Using the ICT means in the didactical process suppose several advantages, both, for teachers and students.

In the Italian report, the most important implementation problems related to digital enhancement in educational systems and teaching practices are identified as a reflection of the challenges dealt with the national context. They can be summarized in two essential dimensions: the ability to innovate and the limits of the implementation logic. For this reason, it is necessary to promote appropriate monitoring, evaluation and follow-up of investment in digital innovation.

Among the problems associated with the implementation, the communication management that characterizes the administrative processes is also emphasized. There is a problem of language that very often appears distant from immediate comprehension and applicability to real contexts and the limitation of an informational system, which is connatural to the linear and transmissible logic of the public administration, emerges, where the



information can not penetrate and reach the potential interested and concerned recipients, as evidenced by this testimony. There is the need to establish a system of information capable of acting as an accompaniment and action of empowerment of citizens, organizations and territories.

National specificity that is considered useful to enhance

In the Romanian report other aspects, which constrain the acquisition and effective use of ICT competences are identified as systemic factors, they affect other areas: bureaucracy, logistics, time resources. Throughout the interviews and focus groups, the following problems occurred:

- overloading teachers and lack of time;
- excessive bureaucracy;
- formative training only because credits need to be accumulated;
- teacher payment being problematic.

As regards the level of transfer of the good practices and the factors that favor and constrain, financial shortages have been mentioned first; money favours, lack of money restricts. The level of transfer of good practice is satisfactory. Training is promoted through the use and enforcement of information protection legislation. Romanian Ministry of Education creates the opportunity for teachers to improve digital skills and communication skills, both in mother tongue and in a foreign language, especially in English from training courses.

In the Italian context, from all the interviews carried out, there are at least three national prerogatives, which we will try to illustrate below:

- territorial diversity: the degree of digital penetration and innovation is very diverse, characterized by a leopard spots distribution. The local component identified by the capacity of the implementation structures to play an institutional leadership role and addressing and coordinating the territory is very important. The open spaces of autonomy with the processes of decentralization to the regions (L. 59/1999) have contributed to highlighting these territorial disparities. The effort thus made through L. 107/2015, which marks the last step in the ministry's intervention to introduce and enhance digital education within educational systems, has tried to intervene precisely on this disparity to standardize opportunities in a widespread and pervasive way;
- polarization of practices: two quite widespread dynamics are observed: on one hand there are very innovator teachers and on the other side the risk of teachers not prepared on the adoption of ICT. To counter this phenomenon, one of the most important actions introduced by L. 107/2015 was the figure of the “animatore digitale” who was immediately transformed into team of “animatori digitali”, because he realized that the school needed more resources on this side;
- the question of the rules: as far as the ordinance dimension is concerned, the most serious issue that is currently under discussion and on which the government is working is the review of the curricula, as it has been done in other countries, in order to clearly integrate the teaching of digital as “culture and digital citizenship”;
- the “restart” in innovation processes: finally, regarding the need for a re-launch in innovation processes, interviews show that the driving force that could be carried out by the centre with investment in infrastructure, equipment, training, etc, has lost his strength. It is now necessary that the strength of renewal be welcomed by schools, in all its components, in synergy with the territories and with the whole reference educative community, in order to rethink a space and a model of school that are adherent to the needs and local reality.



Opportunities in teacher training for the enhancement of their digital skills

The Spanish research report efficaciously summarize some relevant issues on the centrality of teachers training for the enhancement of their digital skills, which recalls a change of paradigm.

There is a complete consensus that teachers have to be competent in the instrumental and methodological use of ICTs. The main competencies that teachers have to have in the digital age related directly to ICT are these ones related to encourage students to become producers of their own contents and not passive agents, become digital competent and integrate technology in the active methodologies, promote teamwork, encourage respect and tolerance towards others, be in continuous training.

So, the reference perspective becomes a lifelong and lifewide learning centered approach.

Some lines of competence training that teachers would have to focus on:

- instrumental use and methodological use of ICT.
- promote its active role in the production of teaching contents.
- new active methodologies that enhance student learning in collaboration and projects.
- be able to actively involve students in their training.
- empowering the participation of families
- to give the bases to be formed throughout the life of autonomous form.

A problem in relation to accreditation procedures emerges: several of the interviewees point to the lack of a clear accreditation system, noting that it's necessary to create mechanisms for the accreditation of these competences that allow the teacher to demonstrate that they have reached a set of established levels, appropriate to each task and that for this reason they are used and valued in the processes of selection and promotion for educational tasks to be performed.

The results of the Italian research confirm that training of teachers and school leaders is considered transversally the central problem of promoting digital innovation in schools.

For this reason, in Italy, one of the central axes of the Good School Reform, insists on teacher training and the enhancement of digital skills. To do this, the Ministry is investing in two special actions: the Schoolkilt tool (format of training, self-production and circulation of good practices agreed through different focus groups) and the sharing of good practices through community building that can continually interact with each other on these issues.

Needs and perspective of improvement

The English research highlights the risk of unwillingness of some staff to learn the new skills needed to fully exploit the potential of digital learning. Across the national survey it was clear that it was individual staff attitudes, rather than age, subject area etc. which influenced this. It was also evident that the solution for this lay is a more well-rounded training approach, which combined support to improve digital skills with information and evidence on the impact and benefits of digital learning for both staff and students



The Spanish research highlights how ICTs allow for the extension and diffusion of some of the objectives of education in the field of personalization of learning, the carrying out of student-centered educational activities, learning based on challenges, and above all collaborative work, which can benefit greatly from the application of technology. ICTs play a fundamental role in bringing education closer to the real world, extending education beyond the classroom and including other areas of the student's life such as his family or personal interests or social circles.

The Romanian report identifies some main skills needed by teachers: creating digital educational content; implementing school management applications; Managing educational content, and not least the pleasure of teaching, of being a teacher; motivation; scientific knowledge; spirit of research, psycho-pedagogical competencies.

The most important areas of skills development are:

- the socio-emotional area (interpersonal communication, educational leadership, problem solving, decision making, Compliance with ethical and legal norms in digital space);
- communicative skills (communication - modern language learning/Digital; Internet browsing; Information/content management; Adaptation to various facilities offered to the modern society: on-line purchase, filling in online forms);
- methodological skills (management of complex processes, planning and evaluation: Creating digital content needed in the knowledge society; Implementing management applications across all domains).

Concerning teacher professional development in ICT, the Romanian report describes:

- some strengths: as availability of high quality practical and applied training courses. The methodical skills needed to integrate ICT into lessons can be developed through teacher training courses. Experience exchanges in other countries: international programs facilitating the exchange of experience for teachers are considered very important for acquiring the necessary skills and represent a way to import good practices in the field of ICT integration. Good practice models within the methodical circles.
- some weaknesses: as strictly theoretical, not related to actual needs or poor quality training courses. Even all interviewed teachers have been trained on AEL (Educational Assistant for Schools) platform, the use of AEL system is difficult, not all of computers can be synchronized and isn't functioning properly. It is necessary to train teachers of other disciplines in using ICT techniques and developing digital competences. Poor offer of methodological courses on ICT integration. Also considered a very stringent need, is the training on didactic methodology in applying TIC in teaching. There is a need for several such courses of methodical training with embedded practice. Difficult access to ERASMUS projects. Lack of schools' equipment, there is a need for acquisition of material resources (tablets, laptops and video projectors, digital board - for class.

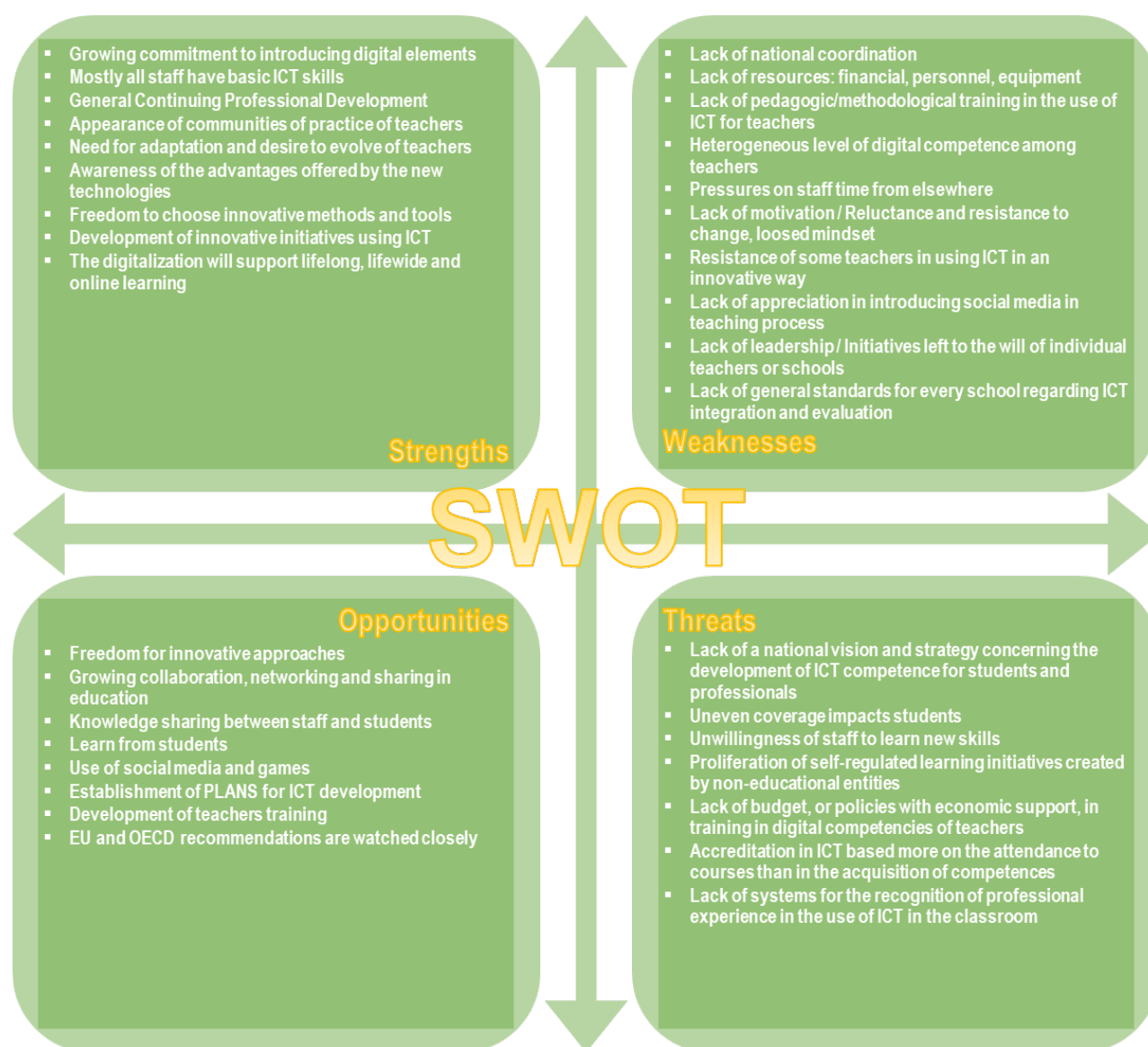


3. Concluding remarks

3.1. Where we stand and perspectives: a transnational SWOT analysis

Starting from the national SWOT analysis a transnational one is proposed.

It considers all common emerging elements and interesting issues, which can have a relevance at national level also for the other countries.





3.2. Recommendations

Some recommendations emerges from the first phase of the project, the field research:

- the need of a national vision for education development, in line with European recommendations;
- the need of a legislative framework, as a general national education law, about education system development in a lifelong and lifewide learning perspective, with a specific focus on the integration of ICTs in the system;
- the requirement of economic investment, which can guarantee equal opportunities in ICTs access, in training, for students and for teachers;
- the financing of Continuing Professional Development to spread innovative practices.

All these issues required to be:

- designed and managed in the long term and in a European perspective;
- managed at national level, of course with a great freedom for local initiatives.