

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**

NATIONAL REPORT: Romania

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TABLE OF CONTENTS

1. Introduction.....	4
2. Romanian national context of integration of ICT in education	6
2.1 National Legislative Framework for the Adoption and the Development of ICTs in Education	11
2.2 Financing Programs / Projects to Implement Innovative Methods with the Support of ICTs	13
2.4 Systems of Assessment and Quality Assurance.....	13
3. National Surveys Results	14
3.1 The Innovation Vision at School.....	14
3.2 Best practices.....	18
3.2.1 National initiatives	18
3.2.2 Transnational initiatives	20
3.2.3 Local initiatives	22
3.2.4 Online resources hubs.....	24
3.3 Teacher Professional Development in ICT	26
3.4 Digital Challenges for National Education System.....	30
3.5 European recommendations and current national policies for ICT and innovating education	35
3.5.1 European recommendations.....	35
3.5.2 National policies for ICT and innovating education.....	35
3.6 Implementation process of ICT educational policies.....	37
3.7 National specificity that is considered critical to be enhanced	42
3.8 Training teachers' digital skills	50
3.9 School and teacher approach and perspective on ICT integration	50
4. Conclusions / results	53
5. Methodological overview	55
1.1 Focus group	55
1.1 In-depth interviews.....	57



Innovative Training Models, Methods And Tools For Teachers In The Digital Age

Romanian Report



1. Introduction

The second intellectual output of DECODE project, follows the first one with the transnational methodology of research and survey on policy at EU level and consists in the national reports entitled „Innovative Training Models, Methods And Tools For Teachers In The Digital Age” (Fi, Uk, Es, It and Ro). The current report present the findings from the investigation on the Romanian current situation regarding ICT in education. This report is aimed to provide a general overview in terms of specific ICT related policies as well as relevant practices in order to better device the future steps of the project, namely: IO3 investigation and development of quality assurance guides for schools in integrating ICT in the education process, survey and respectively the training courses for teachers).

The national researches illustrates, results of a SWOT analysis in teacher training for the enhancement of their digital skills; needs and perspective of improvement; emerging teaching skills for digital era; as well as the most important problems detected and possible solutions.

The aim is to explore the governance practices and to understand areas of analysis like:

- innovative policies implemented in partner countries;
- significant experiences spread in partner countries;
- classification of profiles and skills of educational institutions professionals in the ICT field;
- best practices and educational successful methodologies, spread in the partners countries, for training teachers to facilitate integration of ICTs in educational context and processes.

As a result, the report of the national researches presents:

- a reconstruction of the national scenario: trends and policies activated at national level in relation to the introduction of training models and successful methodologies to integrate into school staff digital competences;
- a framework of the main national laws and legislative funding programs;
- a framework of contractual rules and career perspective in relation to the digital challenges
- the identification of local good or best practices.



The research methodology has a qualitative approach being based on: desk-research on policy documents as well as on Focus-groups and In-depth interviews for data collection from managers and teachers with a leading role at school level (FG), respectively from key actors in the field (DI).



2. Romanian national context of integration of ICT in education

2.1 Status quo

This chapter summarises some key information regarding the status quo in Romania in what the integration of ICT in education is concerned. This is done by surveying various national reports on policy and practices. First, here are some general considerations on the general use of ICT.

The National Progress Report for the Digital Agenda of the European Commission presents the situation in the EU member states referring the performance indicators as well as the growth potential of ICT in Europe. The DESI (*Digital Economy and Society Index*) which is used by this report measures the progress of the EU member states towards a digital economy and society. While this index does not makes comparisons among countries, it shows however the speed of reform in the respective countries. In 2015, Romania recorded significant improvements in developing the digital skills (from 18% in 2014, to 20% in 2015).

The digital competencies are a subdimension of the DESI index. Romania is on the last place in Europe regarding several indicators: connectivity; human capital, Internet use, integration of digital technologies and digital public services. The 2017 DESI Report shows Romania to be at the last positions in Europe in what concerns (Source: <https://ec.europa.eu/digital-single-market/en/scoreboard/romania>):

- Human Capital/Digital skills dimension, (similar to Italy, Bulgaria, Greece)
- the Use of Internet, (similar to Bulgaria and Italy); .
- Integration of Digital Technology by businesses dimension (similar to Poland and Bulgaria)
- Digital Public Services dimension (similar to Hungary and Croatia).

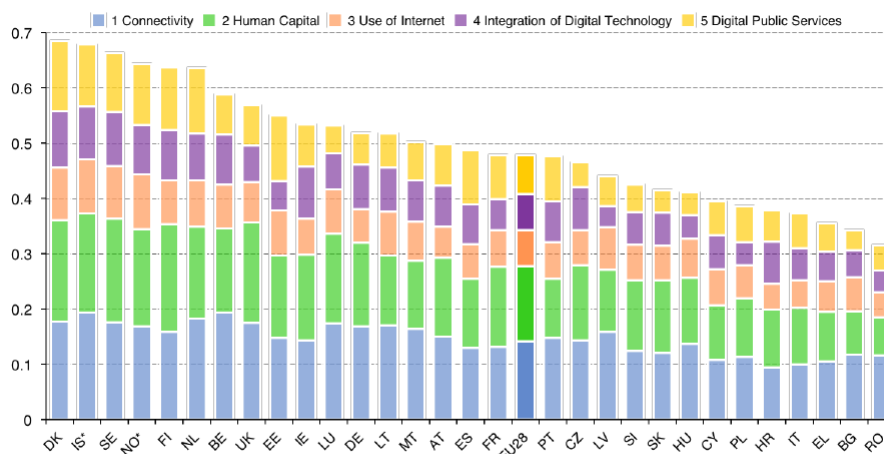


Figure 1. DESI 2015 main ranking

Romania has the smallest number of internet users in Europe (48%), while 39% of its citizens have never used the Internet. This is rather a consequence of the poor living conditions of the population (many do not afford to buy a computer).

Another weak point is the low number of IT specialists against the total work labour force in Romania. This result is explained by the high migration rate of these professionals. An indicator where Romania records a high score comparing to other countries is the graduates of STEM (science, technology, engineering and mathematics) with ages between 20 and 29. The reports details are found at:

- http://ec.europa.eu/newsroom/document.cfm?doc_id=44331
- http://ec.europa.eu/newsroom/document.cfm?doc_id=44464.

Currently it is noticed a large increase regarding the Internet use by children. According to research by the Save the Children Organization in 2012, the vast majority of Romanian children access the Internet daily or almost daily (86% of them). About 90% of children say they use at least one social network, most of them (87%) being Facebook users. The children's activity on the Internet, their permanent connection through mobile devices, the many social functions of applications, programs and sites accessed by children are all a reality and one of the ways in which technology transform the society and our Daily life. It becomes evident the need to link the development of the means of communication and their use by children with the school, family and social environment in which they live. As many studies have shown, digital environments continue to produce major changes in people's everyday lives, both socially and culturally, and psycho-cognitively (Sigur.Info, <http://sigur.info/docs/Studiu.pdf>, 2013).



New technologies have to a high degree changed people's daily lives, communication, ability to understand things, opportunities for development and expression. There is an acute need for the society to adapt to new technologies, to try to understand and use it intelligently in order to make the most of this extraordinary resource. Users need to be cautious when creating a profile in the virtual environment and be aware of the long term effects which the reputation in cyberspace can have on the individual in real life. Parents need to be as aware and responsible for the online activity of children like they are for their activities in real-life. However, the Internet can be more of a basic friend than a fearful foe if it is used responsibly, and this is largely left in the task of teachers and school.

This relative increased ICT use is associated with several risks. According to the same study (idem) two out of three children have seen or received messages with obscene or aggressive content in various forms via the Internet. ICT has made the world more interdependent on digital means, facilitating the free movement of its products, money and information. These transformations are not only positive. For example, access to information has created new forms of exclusion, poverty and deprivation of rights (the so-called digital divide), which emphasizes old inequalities. There has also been an excess of information that people are less and less able to process and verify. Virtual forms of socialization and communication have exacerbated certain social issues such as lack of privacy, self-isolation or harassment. It can be seen that virtual socialization results in human isolation. For children, these challenges are matched by lack of experience and age-specific social intelligence. A lack of experience in this area is also experienced by adults, parents and educators, and long-term consequences cannot be easily acknowledged. Being able to quickly gather information, children are quickly adopting these forms of communication, but they rarely have protection or caution against online dangers.

In what concerns the copyright issues in education, in order to facilitate an appropriate use of digital technologies in education settings, to facilitate teaching in new and engaging ways by teachers, and in order to assure that educators need not deal with complex legal issues, the civil society from several countries, including from Romania, responded to the European Commission proposal for a *Directive of The European Parliament and of the Council on copyright in the Digital Single Market* in September 2016. The initiating organizations are promoting a healthy culture of copyright, there proposals being presented at (rightcopyright.eu/why-now). The proposal currently only recognises accredited schools and universities, however, Romania needs to ensure that other institutions and individuals who are responsible for providing education today are also included in the legal framework.



The findings of the research organized by this initiative clearly indicate that greater use of new technologies and innovative practices in school means greater awareness of copyright among the teachers (The Report Copyright and Education in Europe: 15 everyday cases in 15 countries (April 2017)).

2.2 Development measures

The government strategy to address challenges related to the digital and technological shift and their impact on the current professions, labour force and education systems involves a number of specific measures:

- According to the e-Skills In Europe - Romania Country Report (2014) the national e-Romania Strategy aims at „state modernisation through boosting uptake of ICT by citizens, companies and the public sector”. The spending on set-up of online public services was €90 million in 2010 and € 190 million over the period 2011-2013. Currently, Romania provides several public services online. The Government Programme 2013-2016 included ambitious plans for ICT-related development of the country, such as:
 - Extension of training programmes for Romanian citizens in ICT user skills, with emphasis on disadvantaged groups;
 - Integration of innovative Web 2.0 methods in education and development of online educational learning resources for use throughout the education system;
 - Provision of continuous ICT training programmes for teachers;
 - Organisation of national competitions for educational eContent in schools;
 - Achieving full computerisation of educational establishments and services.
- The “Economy Based on Knowledge” programme comprised measures for boosting ICT usage in rural schools and libraries, with a target group of 1,000 teachers and librarians from 229 schools to take-up digital technologies in the educational process. These were trained in how to combine traditional and interactive, ICT-enabled teaching methods including Open Educational Resources and the Web 2.0.
- The Ministries for Information Society and the Ministry of Education supported the EU e-skills initiatives, supporting programs and national awareness campaigns dedicated to students and SME’s with the involvement of private stakeholders (i.e. Intel, Microsoft, HP, IBM, Siveco, and NGO’s, such as APDETIC, a member of Digitaleurope, Junior Achievement, Irex).
- The Ministry of Education launched in 2001 the national program Digital Education System which lasted for 10 years and included several significant developments:
 - programme for teachers training,



- providing schools with equipment and
- education software - AEL.
- The European Framework of Key Competencies of the European Commission as well as other relevant EU policy documents were correspondingly reflected in several national documents:
 - The National Education Law nr. 1/2011 - states that the national preuniversitary curriculum pursues the development of the key competences, including the digital competence. This is done by the following subjects matters: ICT as optional subject matter in primary education and as compulsory subject matter for the lower and upper secondary education. The principles of the development of the national curriculum were: competencies based; students learning time; flexibility of the curricular offer; integrates approach of learning (mono, pluri, trans-disciplinar);
 - The Education Plan – defines the training profile of the graduate of compulsory education and explicitly target the developing of the digital skills. The students should be able to use digital devices and applications to search and select relevant digital resources for learning to be able to develop digital multi-media content, using simple coding languages, to observe the regulations for developing and using virtual content (property rights, privacy, Internet safety). There is an increased number of school decided curriculum (CDS). The definition of the new Education Plan was based on a large (around 20,000 directly involved) and transparent public consultation process involving representatives from all professionals and stakeholders (members of the Romanian Academy, representatives of the higher education institutions, researchers, experts and practitioners):
 - Gymnasium - starting with the schools year 2017-2018 all lower secondary pupils in Romania will study each year from the 5th grade to the 8th grade a new subject matter called Programming and ICT with an allocation of 1 hour per week according to the OMENCS 3590/5.04.2016;
 - Hih-school - there are studied two subject matters: ICT for developing the digital competencies of mainstream students; and Programming for IT specialists.
- There are a number of support measures for the formal education through the nonformal activities:
 - The Ministry of Education encourages schools/educational institutions educational projects and partnerships with different companies (through the „Scoala altfel” nonformal activities or different funding programmes where the ICT tools where harnesed for educational purposes).



- The Ministry of Education funds several national school contents in various fields including Programming. These are supplemented by those funded by the local authorities.
- Many high-schools became testing centers for ECDL (European Computer Drivind License) as one of the most well known digital skills certification programs in more than 138 countries, offering a standard basis of IT knowledge usefull for the knowledge society.

2.1 National Legislative Framework for the Adoption and the Development of ICTs in Education

The main legal national documents are:

- National Strategy on the Digital Agenda for Romania 2020 (Sursa: <http://gov.ro/en/government/cabinet-meeting/national-strategy-on-the-digital-agenda-for-romania-2020>), approved by Decision of the Government September 2014 takes over and adapts to the situation of our country, the elements of the Digital Agenda for Europe, one of the seven flagship initiatives of the Europe Strategy 2020. It defines the major role that the use of information and communication technology (ICT) will have to play in meeting the Europe 2020 objectives. A full implementation of the strategic vision of the ICT sector in Romania will result in a total investment of around 2.4 billion euro. Direct and indirect impact on the economy can be translated into a GDP growth of 13%, increase in the number of jobs by 11% and cut in administration costs by 12% during 2014-2020. The National Strategy defines the framework for an institutional structure that will provide a unified vision, will centrally and coordinately manage all aspects of computerization of public services and achieving interoperability at European level. This is structured on 4 main fields of action and a set of design principles (1. Encourage and attract honest tax-paying citizens and businesses, 2. Put the citizens and businesses at the center of any initiative, 3. Use standards and reference models, 4. Formulate legislation to support the initiatives, 5. Protect security and privacy, 6. Encourage transparency and openness, 7. Drive continuous improvement, 8. Aim for sustainable initiatives, 9. Facilitate innovation, 10. Maximize initial investment).
 - Field of action 1 – eGovernment, Interoperability, Cyber Security, Cloud Computing, Open Data, Big Data and Social Media
 - Field of action 2 – ICT in Education, Health, Culture and eInclusion
 - Field of action 3 – eCommerce, Research-Development and Innovation in ICT



- Field of action 4 – Broadband and Digital Services infrastructure.

Concrete measures set out in the Strategy will lead to:

- Ensuring access to electronic public services for citizens and organizations (e-government services);
- Improving access to the Internet by increasing the coverage of high-speed electronic broadband communications networks;
- Increased use of the Internet;
- E-commerce promotion;
- Increasing the number of cross-border electronic public services;
- Enhancing digital content and the development of ICT infrastructure in education, health and culture;
- Supporting the growth of the ICT sector added value by supporting research, development and innovation in the field.

The strategy also establishes the following indicators for 2020 Romania:

- At least 35% of people use e-government systems;
- At least 60% of citizens use the Internet regularly;
- At least 30% of citizens make purchases online;
- Coverage with broadband communication networks (over 30 Mbps) of minimum 80%.
- The importance of developing the needed ICT skills to cope with the demands of the digital society to school graduates acknowledged by the European Commission (through the European Framework of Key Competencies and other policy documents), was correspondingly reflected in several national documents:
 - National Education Law (www.edu.ro) with specific statements on development of digital skills including in compulsory education;
 - Education Plan OMENCS 3590/5.04.2016 (www.programe.ise.ro). The National Education Law states that the national preuniversitary curriculum pursues the development of the key competences, including the digital competence, while the training profile defined in the new Education Plan includes as explicit target the developing of the digital skills. Starting with the schools year 2017-2018 all lower secondary pupils in Romania will study each year from the



5th grade to the 8th grade a new subject matter called Programming and ICT with an allocation of 1 hour per week.

2.2 Financing Programs / Projects to Implement Innovative Methods with the Support of ICTs

Digitaliada - www.digitaliada.ro, national contest of designing innovative educational ICT based resources. The contest is addressed to teachers and is organised by the Orange Foundation. It aims to promote digital education, support learning by digital means, by implementing 10 selected best practices in 10 schools from România, at the V-VIII grades, during the 2016-2017 school year.

ICT skills of guidance practitioners – is a project which was funded by the LLP programme of the EC which developed a framework for the development of ICT skills of guidance practitioners, train the counsellors and develop relevant online tools for managing the guidance and counselling processes.

SABER project - www.saber.worldbank.org: The project adapted a tool of the World Bank for Romania which aims to support education processes by relevant and evidence based data by: collect, analyse, and compile expansive and high quality country data; build a global knowledge base; develop a more holistic analysis of education systems. The tool provides:

- conceptual framework for policy drivers of student outcomes;
- survey tools to assess policy intent;
- country and regional diagnostic reports to inform policy dialogue;
- survey tools to assess policy implementation.

2.4 Systems of Assessment and Quality Assurance

There are no currently any specific regulation for the Assessment and Quality Assurance of integration of ICT in Education. Schools are organised in legal entity ones and „structures” which are represented legally by the respective legal entity school in the area. Within each school there function several committees, on of the most important being the Quality Assurance and Evaluation Committee. The Ministry of Education provided a Guide for the functioning of this committee (<http://oldsite.edu.ro/index.php/articles/8103>).



3. National Surveys Results

In this chapter we present and discuss a SWOT analysis regarding the implementation process of TIC in the Romanian education system, based on the main issues emerging from the deepening interviews and focus-groups. The chapter is focused on the following aspects, each composed of two parts: one that deals with the assets (advantages, favourable circumstance, positive aspects), the other with the shortcomings (gaps, flaws, deficiencies, vulnerabilities):

- Trends in ICT based and innovative education;
- Implementation process of ICT educational policies;
- Teacher professional development in ICT;
- Involvement from NGOs and business environment;
- School and teacher approach and perspective on ICT integration, systemic factors.

Every section is illustrated by relevant excerpts from the collected research material.

3.1 The Innovation Vision at School

Respondents indicated that an innovation in their setting means „not getting stucked to a personal limit”, „wishing more for you and your pupils”. In a practical sense, it means „bringing something new by using various ICT tools like serious games including in not very appealing subjects like economics”. Innovation „requires openness and creativity, which in turn needs desiring more from oneself”. ICT tools stimulate children in the learning activities.

School innovation, on the other hand is a challenge for teachers and students. „Innovation must ensure sustainable development”. The school can and must combine applied sciences and classical theory of mechanics, electronics, electro-technics, and ICT with what is newer. This has as results innovations in every area of life/discipline (mechatronics / robotics). Game based learning plays a very important role, applications in the field of mechatronics from kindergartens through platforms developed by LEGO - it supports the development of technical thinking and problem solving skills. The design of a device starts from the mechanical part, from what it is expected to execute, and then proceeds to the programming. It is proposed to



introduce in the curriculum some applications that foresee the application of mechatronics in which to develop both scientific thinking and technical skills.

In the schools' view innovation requires:

- digitization of the didactic process;
- the correct and efficient use of technology;
- higher digital literacy of all actors;
- equipping schools with modern technology;
- introducing IT technology into administrative work;
- access to new technologies and the transfer to the student, which involve ethical and moral aspects;
- access of disadvantaged children to technology;
- removing teacher reluctance towards the acquiring new skills.

Some colleges aims to promote innovation in education by introducing tablets, Ipads and free applications available on smartphones in the teaching-learning process.

Interests groups were set-up on various platforms as: Yahoo, Google, Facebook etc. Thus, "Cuza" College from Ploiesti has set-up a Yahoo Group for the communication between the teachers in the school. Although initially the majority of teachers was reluctant to use the groups, due to the need to improve communication at school level, and facilitated by a recommendation of an inspection from the National Agency for Quality Assurance, eventually the teaching staff understood the usefulness of the instrument and started using on a regular basis. Were organized courses with school teachers so that they could use this group, and subgroups for curricular areas and classes were created within the Yahoo group to increase the effectiveness and relevance of communication. These groups facilitated exchange of teaching materials by the teachers, communication among pupils (i.e. solutions to problems), teacher's communication with both the pupils and the parents.

A Google Form for the non-formal learning program "The Other School" has been created, which generates a table in which the school can track the name, venue, and time interval for each class activity. The utility was proved on the very first day when there was an inspection of the Local Police on the documentation of the pupils' participation in activities outside the school, the form making it very easy to identify each individual school activity.

"The best practice is not to use software within the class, but to integrate lesson moments in which we use a digital application. ICT must be integrated in a clear moment of lesson, a limited time, with immediate



feedback; otherwise I lost the students' attention. It's like letting the students one hour to play on the computer. ICT tools can be used in specific lesson moments, to be integrated into a traditional lesson."

Multimedia presentations of different materials are used in:

- collection of educational resources to be used in the classroom
 - <http://www.scoop.it/u/sanda-craina>;
 - <https://ro.pinterest.com>;
- presentations
 - during the biannual methodological and pedagogical activities of the Pedagogical Informatics Circle
(http://prezi.com/zgkqkii1qhdj/?utm_campaign=share&utm_medium=copy&rc=ex0share);
 - the analysis report of the Computer Science and ICT Department, conducted in the Powtoon application and published on Youtube, <https://www.powtoon.com/online-presentation/c8PEbqOFOVI/raport-activitate-sem-i-2014-2015>
 - for ERASMUS+ project - Pedagogy and performance through the technology of the future, (5 – 16.10.2015, Portsmouth, United Kingdom), <https://prezi.com/r30je2snjtan/training-vision/>
<https://prezi.com/1-ipqzwyrvpa/portsmouth>
- a virtual catalog, where you can write down the results of evaluations, absences, receive and send messages from / to parents, students, <https://www.adservio.ro>;
- Google Drive is used by the administrator teacher of class to collect and access personal information stored the end of the catalog; to monitor the responsibilities of each student of the class; to create a friendly atmosphere between the teacher and his students - "break the ice" at the beginning of the school year (passions, qualities, defects, expectations ...)
- Programming activities
 - „Hour of Code”, project, <https://ro.code.org/>
 - developing Oracle courses, a course that is recognized and matched in the digital competence assessment of the baccalaureate exam where each participating student has an account <http://ilearning.oracle.com/ilearn/en/learner/jsp/login.jsp?site=OracleAcad>

Also, ICT facilities are used for administrative and managerial school activities:

- A schedule management program was created in Visual Basic to work with an Excel interface. The program facilitates verification of overlapping of subject hours (classes that have two different



disciplines at the same time in the program), displays the schedule by classes / by teachers / by day,

http://prezi.com/y_0kyiwhdgk/?utm_campaign=share&utm_medium=copy&rc=ex0share

- Google Drive is used by the administrator teacher of class to collect and access personal information stored the end of the catalog; to monitor the responsibilities of each student of the class;
- Various educational platforms like: <http://curscraina.wikispaces.com/>;
http://curscraina.wikispaces.com/Cerc_Pedagogic_2016
- Platform used for administration of a class, https://www.cloudschool.org/sanda_craina

The Graduate profile: Competencies of the XXI century

The digital revolution and the challenges of artificial intelligence change learning, foster exchange of experiences with teachers from other European countries who want to implement new teaching and learning strategies with tablets, Android systems, smartphone applications etc. For example, the main objective of the "High School, High Tech - School of the Future" project is the formation of a teaching staff with digital competences in line with the European e-skills requirements for the 21st century, able to implement modern teaching methods and strategies The help of which will be the student-centered education by introducing the tablets in the classroom.

Based on their experiences, the participants mentioned that in a modern, multicultural society of the 21st century it is necessary to develop competencies like:

- Communication - modern language learning/Digital;
- Internet browsing;
- Information/ content management;
- Compliance with ethical and legal norms in digital space;
- Creating digital content needed in the knowledge society;
- Implementing management applications across all domains;
- Adaptation to various facilities offered to the modern society: on-line purchase, filling in online forms.

The main skills that teachers need to have are: Creating digital educational content; Implementing school management applications; Managing educational content. Very important for successful educations are: the pleasure of teaching, of being a teacher; motivation; scientific knowledge; spirit of research.



A teacher is required to master a set of psychological skills: taking into account the pupils' needs, the pupils' group profile and the socio-cultural environment of the educational institution. Among the digital competences acquired and used in everyday life that might be useful in school or are really used in school are the socialization platforms through which teachers and pupils interact. The acquisition and use of these skills depends on human quality, specialized knowledge and the distributive attention of the teacher, empathy, the adaptive and re-adaptation power to the pupils, their age, students' understanding, maintaining and gaining students' attention.

"It has always been a concern in our school that teachers of all disciplines to integrate ICT at didactic activity, so that we are able to respond as well as possible to the needs of the students; The Internet is a great opportunity for us".

3.2 Best practices

The aim of this chapter is to give an overview of practices that were highlighted by participants to interviews and focus groups. In order to make the information easier to browse, the practices were divided into four categories (national initiatives, transnational initiatives, local initiatives, online resource hubs). For each practice we tried to put together information about the promoter, aims of the initiative, resources used and results attained.

3.2.1 National initiatives

For this chapter we have selected initiatives that involve 2 or more development regions (NUTS level 2) in Romania.

Initiative 1

Name: Internet în școală ta [*Internet in your school*]

Promoter and partners: Ministry of Education

Aims: Improving access to broadband internet and the ICT infrastructure in rural and small urban areas, as well as the acquisition of ICT skills.

Resources used: The European Social Fund



Results: 2446 institutions under the Ministry of education were connected to broadband internet, thus improving access to the internet for over 700000 pupils and 50000 teachers.

Additional information: <http://internetinscoalata.edu.ro/>

Initiative 2

Name: Programul IT&S (TIC și Strategie Didactică) integrat și inovativ de formare profesională continuă a personalului didactic din regiunile București-Ilfov și Sud-Muntenia [*IT&S Training Programme – ICT and didactic strategies for teachers in București-Ilfov and Sud-Muntenia regions*]

Promoter and partners: School Inspectorate of the Municipality of Bucharest

Aims: To improve access and participation to initial and continuous training opportunities for teachers in București-Ilfov and Sud-Muntenia regions. To develop the abilities of teachers to use interactive teaching methods and ICT.

Resources used: The European Social Fund

Results: Training 6000 teachers in the use of innovative teaching methods and the use of ICT in educational settings.

Additional information: <http://ismbcl.software-educational.ro/>

Initiative 3

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/>

Initiative 4

Name: Oportunități pentru o carieră didactică de calitate printr-un program național de formare continuă a profesorilor de matematică din învățământul preuniversitar [Developing opportunities for a quality career through a national continuous training programme for maths teachers in secondary education]

Promoter and partners: Ministry of Education, University of Bucharest, Teacher Training Centres, Romanian Society for Mathematical Sciences, Softwin

Aims: Development of digital resources for teaching maths at secondary level.

Resources used: The European Social Fund

Results: Training of 4000 teachers in the use of digital resources when teaching maths.

Additional information: www.matedidactica.ro; <http://portal.matedidactica.ro/>

Initiative 5

Name: Formarea continuă a profesorilor de matematică în societatea cunoașterii [Continuous training for maths teachers in the knowledge society]

Promoter and partners: Iași County School Inspectorate, Ministry of Education

Aims: Equipping maths teachers to develop and implement curricular activities while using ICT resources.

Resources used: The European Social Fund

Results: Over 5000 teachers trained, through an online platform, in the use of the technologies in teaching maths.

Additional information: <http://matematica.isjiasi.ro>

3.2.2 Transnational initiatives

For this chapter we have selected transnational cooperation projects involving at least one Romanian partner. The involvement of Romanian schools and educational organisations in such projects is closely linked to participation in the Lifelong Learning Programme (2007-2013) and its successor, Erasmus+ Programme.



Initiative 1

Name: Dezvoltarea competențelor digitale de lucru pe platforme colaborative ale viitorilor învățători [*Developing the digital competences of primary school teachers for working on the collaborative platforms of the future*]

Promoter and partners: Liceul Pedagogic Vasile Lupu (Iași)

Aims: To improve the digital skills that teachers use within their work.

Resources used: Erasmus+ - KA1

Results: Training stage of two weeks in Spain for Romanian teachers on the use of ICT in education.

Additional information: <http://scoalanormala-vasilelupu.ro/index.php?page=proiecte>

Initiative 2

Name: Open the gates to the universe

Promoter and partners: 5 schools in 5 European countries (Romania, Cyprus, Portugal, Poland, Republic of Moldova)

Aims: To encourage primary school pupils to explore notions related to astronomy by engaging with their peers in schools throughout Europe by using ICT.

Resources used: Erasmus+ - eTwinning

Results: Groups of 9 year old pupils, from the five schools involved, have worked together on tasks related to astronomy, in the end producing an e-magazine to present the process.

Additional information: <https://twinspace.etwinning.net/12520/home>

Initiative 3

Name: High School High Tech - Școala Viitorului

Promoter and partners: Colegiul Tehnic „Edmond Nicolau”

Aims: Training 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.

Resources used: Erasmus+ KA1 2014-2016



Results: Training course for nine teachers on the use of ICT in education developed by a Finnish organisation.

Additional information: <https://highschoolhightechscoalaviitorului.wordpress.com/>

Initiative 4

Name: bringing life into the classroom: innovative use of mobile devices in the educational process

Promoter and partners: Colegiul Tehnic „Edmond Nicolau” and five partners from European countries.

Aims: Promoting the use of mobile devices in teaching

Resources used: Erasmus+ KA2

Results: 6 learning mobilities for pupils and 6 trainings for teachers from partner organisations on the topic of the use of ICT in education.

Additional information: <http://ctehen.ro/proiecte/briging-life-into-the-classroom/>

3.2.3 Local initiatives

This section covers initiatives which were implemented in individual schools or in groups of schools situated in close proximity.

Initiative 1

Name: Educational software

Promoter and partners: Colegiul Național Emil Racoviță (Iași)

Aims: To engage students in developing small scale software apps.

Resources used: Internal

Results: Over a dozen software apps on educational topics (e.g. grammar, literature, culture, physics).

Additional information:



http://racovita.ro/index.php?option=com_content&view=article&id=377:software-educational&catid=179:info&Itemid=159

Initiative 2

Name: Centrului de Excelență pentru Robotică Educațională [Excellence Centre for Educational Robotics]

Promoter and partners: Colegiul Tehnic „Edmond Nicolau” (Focșani)

Aims: To promote the teaching/learning of elements related to ICT, technology, maths, programming and engineering.

Resources used: Internal

Results: Creation of a students’ club for robotics and programming engaged in a large number of national and international projects.

Additional information: <https://roboticaexcelentavrancea.wordpress.com/>

Initiative 3

Name: Centrul de pregătire a elevilor de gimnaziu capabili de performanță la matematică și informatică [Centre for training highly skilled pupils in maths and programming]

Promoter and partners: Vrancea County School Inspectorate

Aims: To support the development students’ of skills related to maths and programming.

Resources used:

Results: Close to 200 pupils/year are engaged in activities related to programming.

Additional information: <https://excelentamateinfo.wordpress.com/>

Initiative 4

Name: *Programa opțională de informatică pentru gimnaziu* [Programming curriculum for the lower secondary cycle – elective course]

Promoter and partners: Vrancea County School Inspectorate



Aims: To create and promote the implementation of a curriculum on programming for the lower secondary cycle at county level.

Resources used:

Results: Since 2008 the Vrancea County School Inspectorate has promoted the inclusion of this subject within the education offer of schools under its coordination.

Additional information: <http://isjvn.vn.edu.ro/utile/informatica.php>

3.2.4 Online resources hubs

This section focuses on online resource hubs created through both nation and international initiatives which are used in Romanian schools.

Initiative 1

Name: MaST networking - calitate în dezvoltarea competențelor cheie de matematică, științe și tehnologii [MaST networking- quality in developing key competences for maths, science and technology]

Promoter and partners: 5 County School Inspectorates, Quality Assurance Agency for Pre-university Education,

Aims: Improving the quality of education by developing the capacity of schools to build key competences in the areas of maths, sciences and technologies.

Resources used: The European Social Fund

Results: Development of an online platform used in teaching maths, sciences and technologies.

Additional information: <https://www.mastnet.ro/>

Initiative 2

Name: INSAM - Instrumente digitale de ameliorare a calității evaluării în învățământul preuniversitar [*INSAM – Digital tools for improving the quality of the pre-university level educational system*]

Promoter and partners: Ministry of Education

Aims: Developing and implementing digital tools for improving the evaluation and self-evaluation in upper-secondary education. Promoting the use of ICT throughout the school curriculum.



Resources used: The European Social Fund

Results: Over 700000 pupils and 10000 teachers have accessed the (self)evaluation tools.

Additional information: <https://insam.softwin.ro/insam/home.do>

Initiative 3

Name: AEL

Promoter and partners: SIVECO Romania

Aims: To create an e-learning platform for a wide range of subjects within the national curriculum.

Resources used: Private funds.

Results: All schools in Romania have benefited from training programmes on the use of the platform.

Additional information: <http://www.advancedelearning.com>

Initiative 4

Name: Didactic.ro

Promoter and partners: Intuitex

Aims: To create an online community for sharing tools and experiences related to K-12 education.

Resources used: Private funds.

Results: Online portal with resources and forums for teachers.

Additional information: <http://www.didactic.ro/>

Initiative 5

Name: Space Awareness

Promoter and partners: European Space Agency.

Aims: To develop quality tools to inspire and engage young people in science with space.

Resources used: Horizon 2020

Results: A large selection of educational materials grouped by the age of the targeted pupils.

Additional information: <http://www.space-awareness.org/>



Initiative 6

Name: Scientix

Promoter and partners: Network of national contact points (<http://www.scientix.eu/in-your-country>)

Aims: To promote and support a Europe-wide collaboration among STEM (science, technology, engineering and maths) teachers, education researchers, policymakers and other STEM education professionals.

Resources used: Horizon 2020

Results: A large selection of educational materials grouped by several search criteria. It offers the possibility to request the translation of resources into national languages.

Additional information: <http://www.scientix.eu/>

3.3 Teacher Professional Development in ICT

■ Strengths:

- 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. With an international tradition in more than 40 countries, launched in 2000, the Intel@Teach Program debuted in Romania in January 2007 and was implemented by SIVECO Romania. The idea was that teachers must not assimilate information passively, but learn to work effectively during an intensive training course in which they alternate "face to face" training with practical themes and individual applications. They had the opportunity to accumulate a different learning experience that they can then use in the classroom, in which the teachers have built the lesson project. Practical courses like these are useful if a teacher is put in the position of doing things, doing a project, making software, and giving lessons to real pupils in which they integrate what is learned. The training course has, finally, no real impact if the content is mainly theoretical, without a practical end. Teachers want to learn, but they do not want to attend too much to theory, they want to learn applicative things that are useful to the class.



An impact study analysing the results of the Intel® Teach Program - Learning in the Knowledge Society in Romania was carried out by a team of teachers and researchers from the Departments for Teaching Staff Training at the Technical University of Civil Engineering of Bucharest, the Polytechnic University and the University of Bucharest, with the support of the Institute of Educational Sciences, on a representative sample of 505 teachers who graduated from this program. The impact study revealed that 82.8% of teachers who have followed this program now use IT & C in a manner that involves modern pedagogical resources, that they integrate in a creative and innovative way in their own teaching.

Relevant excerpts from focus groups and interviews

"We have had two practical training courses, one was "Intel Teach - Learning in the Knowledge Society" - to which a teacher had to build a tail head project. It's a course, not made by us, made by Intel in collaboration with the American Teachers' Association. It's an absolutely exceptional course because we do not work on projects until this course. A project usually consists of the following: I give a group of pupils a theme, after which the group of students presents a power point in front of the class and they are given a mark, most of them 10. That did not happen in the Intel Teach project - from the clear sheet of the project's work assignments, the project management evaluation sheet, the evaluation tool for each pupil's activity, the team evaluation sheet, all of which must be followed throughout the whole project.[...] I remember, after Intel Teach, the feedback was seeing colleagues integrating, coming to show me the checklist, doing the individualized work sheet for each student in the class, depending on the gaps she was finding. Then, I felt that the course had an impact, when I saw that students apply in class what they had learned at the course." (focus group, Iasi)

National education policies support the development of pedagogical and methodological innovation through ICT through programs such as *Teacher Training in the Knowledge Society: DeCeE; The Internet in your school* - that is a national project, or the *INSAM (Digital Improvement Quality Assessment in Pre-University Education)* that aimed at developing and implementing digital tools and mechanisms.

The project *"At a click of modern and efficient education"* was an ample European project run by the County School Inspectorate (ISJ) Iasi, in partnership with ISJ Tulcea, Iasi Teaching Staff House and SIVCO Romania, and was ended in 2013. The training courses of the first two series (a total of 12 groups with about 300 teachers) were completed. Graduates of the first training series were evaluated between March 24th and



March 25th (the first six groups), followed by the other six groups in the first series and the graduates of the second series being evaluated in April 2013. Teachers attended the training courses like: "ICT Training for Primary Teachers" - offered by Babeş-Bolyai University, or courses offered by SIVECO, training / qualification courses in database management.

- 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.

Relevant excerpts from focus groups and interviews

„A Comenius Project "Educating Global Citizens through Innovative ICT and Social Media" organized by the European Schools Project in Gouda, The Netherlands, in March 2013, following which my colleagues and students benefited from information on achievable projects as digital and global citizens; Presentation of the project: <http://espnet.eu/>, <https://www.facebook.com/europeanschoolsproject/>

“Pedagogy and Performance through the Technology of the Future”, project funded by the European Union under the Erasmus + 2014 Program, KA1 Learning Mobility of Individuals; The project was carried out in two stages: Sevilla-Spain in the summer of 2015 and Portsmouth-UK in October 2015. The purpose of the project: learn innovative technologies applied to education; Many school teachers who have learned and disseminated new technologies (i.e. Web 2.0 category) used them in the classroom. <https://prezi.com/r30je2snjtan/training-vision>

An Erasmus K1 project, proposed in Seville, provided a training course on ICT skills - "The Teacher in the Digital Class". There I learned how to create a blog, how to use wordpress, how to use Moodle placards. And we have a Moodle-like platform at school - Negruzzi IT is called and even put some videos using the interactive whiteboard in the classroom.” (Mihaela Tura, Iași)

- Good practice models within the methodical circles:



Relevant excerpts from focus groups and interviews

"In the past years, but also this year, there are different themes in different disciplines that aim at using these means and integrating them into didactic activity. And these activities are done with students within these methodical circles. And here come the teachers from several schools, there is an activity and then the topic is discussed." (Mihaela Tura, Iasi)

"The availability of training courses within the County Teaching Staff Training Center offering courses on the use of ICT resources in the classroom (I personally participated in two such SOP HRD courses titled ICT Advanced - The School - Active Member of the Information Society and European Dimensions in Teaching English) and they seemed very useful and applicable to the classroom." (focus group, Bucharest)

Weaknesses:

- 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.

Relevant excerpts from focus groups and interviews

"it's just a theory that will not have any concrete results." (focus group, Iasi) "As a teacher, you have to manage these resources very well and there is still a lot of training to be done, but it has to be effective, to rely on the teacher's needs. The teacher wants to be trained to work with actual digital resource database and integrate those things and see examples of good practice." (focus group, Iasi)

"Training courses offered by the County Teaching Staff Training Center are of variable quality and their lessons are less attractive. Courses should be interactive." (focus group, Vrancea)

- 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.

Relevant excerpts from focus groups and interviews

"The necessary digital skills are minimal. Not digital skills are the problem, but the



methodical ones. I remember the first time when I tried to integrate into a lesson a software of my own and I thought very much at which point of the lesson should I integrate it, how should I do it, how to organize my time. Me, being a computer science teacher, having digital skills and mastering the software at the last pixel. I had trouble rethinking my lesson to integrate those moments of software. A lesson in which you integrate software must be pre-arranged, from checking your tools, checking if the software works on the tools. Then you have to introduce it for the students from scientific point of view, to capitalize on the experience acquired by students in the lesson. Otherwise, you just sit on the computer.” (focus group, Iași)

- Difficult access to ERASMUS projects

Relevant excerpts from focus groups and interviews

“Training in projects such as ERASMUS are hardly accessible to the "general public" and they really would facilitate the change of mentality!” (focus group, Bucharest)

- Lack of schools' equipment, there is a need for acquisition of material resources (tablets, laptops and video projectors, digital board - for class.

3.4 Digital Challenges for National Education System

The challenge for teachers is to learn to use modern means and learn to transfer what they have learned. Our education and career systems need deep changes to prepare teachers for digital globalization. One of the conclusions drawn from interview research 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. 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.

The SWOT analysis identified the following main issues for the appropriate integration of ICT in schools. Building on the positive aspects and catering for appropriate solutions, while tackling at the same time the negative external and internal ones is a key to harnessing the full potential of ICT for education. 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, decision 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, like:

- gives a new and more meaning role to the educator;
- it stimulates the creativity of teachers in the educational process;
- diversify the assessment methods and tools;
- grow the objectivity of assessments;
- stimulate the integrated didactical approach, interdisciplinary and trans-disciplinary education;
- optimize the teaching-learning activity;
- optimize the quickly feed-back through assessment on digital form;
- adapt the teaching to the needs of students group;
- fast data processing and interpretation;
- increase the share of classroom learning time;
- motivate students to achieve academic progress;
- stimulate the creativity of students;
- increase students' confidence in the assessment process;
- develop interest in the integrated, interdisciplinary / trans-disciplinary approach of the discipline;
- stimulate innovative learning capacity and strengthening scientific investigation skills.

SWOT analysis

- **Strengths:**
 - the Ministry of Education is becoming increasingly open, meaning that before adopting a law it puts it in public debate. Thus, any of the educational actors has the opportunity to improve the content of the respective bill. We can speak of a more direct communication between decision-makers and beneficiaries;
 - teachers are open to developing their digital skills;



- many of the Romanian schools have functional hardware and software resources;
- many of teachers can use multimedia resources and develop educational resources;
- headmasters and inspectors use the platform for management of school and for educational management;
- there is a willingness of students, parents and society as whole to use modern technologies.

■ **Weaknesses:**

- It is acutely felt the lack of school licenses for IT software;
- a technical service for the schools is not covered in order to keep the computer systems in optimal functional parameters; that have the record of the teachers' activity; to track and of student activity.
- the funding for schools for own research on the needs of students, parents, local community is inexistent.
- the new school curricula are misunderstood by the teachers, as a consequence it isn't optimally applied; In context of the recent curricular changes that are now in the process of being implemented (i.e. the introducing Coding and ICT subject at Middle schools), there is a risk that some of teachers will not understand the new curriculum program. The new changes were not supported by enough training and support measures; prejudices from previous experiences tend to leave teachers the impression that the elements required for school competition are in the core curriculum, which is not true; while the later belongs to another institutional structure - the Center of Excellence.
- some teachers believe that what they know at the moment is enough, it is also untrue, it requires a continuous improvement in ICT tools: given the pace of development in this area, participation in continuous training courses is not enough.
- in terms of innovation in teaching, there is not a balance between didactic preparation work and classroom time; depending on how much time is necessary to design didactical activities, because the teachers have to work at home, at school, beyond the norm of teaching.
- for a teacher there are many teaching tasks, countless bureaucratic tasks and there is not enough time for the actual preparation of the didactic activities In fact, each class course is an innovation adapted to the student class; the teacher has to demonstrate creativity, empathy and adaptability;



- using the socialization platforms for teacher's interaction with pupils has several drawbacks. The use of digital skills depends on human quality, specialized knowledge and the distributive attention of the teacher, empathy, the adaptive and adaptation to the pupils, their age, students' understanding and knowledge of capture techniques, maintaining and gaining students' attention. Bureaucracy greatly restricts the acquisition and use of these skills.
- the didactic norm is not properly defined: it should be composed of the actual teaching norm, the norm for study for didactic training, the norm of collaboration with the parents and the civil society in the area and the norm for assuring the assistance - the additional training of the pupils.
- it is a great problem to correctly understand the status of ICT in the educational process, while in the activity of each school, the goal is not to be integrated;
- the loss of traditional work skills, lower capacity of working memory; high dependence on computer system collapses;
- the use of ICT in particular will lead to lessening of practical skills and the loss of the sense of reality.

■ **Opportunities:**

The opportunities for national education system imply:

- Developing of strategies for allocating sufficient funds for the development and purchase of software for school institutions;
- Promoting the ICT, technology, mathematics, informatics, engineering within a Center for Excellence for Educational Robotics;
- Accessing European funds for training of teachers in ICT fields.

The opportunities found in the responses of the teachers involved in the focus group refer to the innovation vision of schools, developing of key competences and best practices, and professional development. Opportunities offered to the educational system by means of ICT are in terms of time gained, high content of information in various forms and adapted to different types of learning.

- there are various relevant free dedicated software / (multimedia) educational resources that can be adapted to different types of learning), of platforms for school and educational management;
- accessing funds for ICT in schools;



- using training platforms for teachers
- must improve actual communication and develop a national system to research educational free software dedicated or that can be adapted for national curriculum;
- actual changes on national Romanian curriculum lead to development of new educational resources, school manuals, including manuals in digital form;
- the politics of EU stimulate accessing of funds for ICT in schools.

The use of ICT has made changes in each of us in all respects, especially in terms of distance communication, both with family and socially or professionally. The didactic film, communication with students and colleagues contribute to personal and professional development. The key elements are access to information (I can search for materials and adapt them), access to methods and communication with others.

■ Threats:

There is a higher access to the new technologies of young people, with all the risks that arise: irresponsible use of online games, social networks, cyber-attacks. ICT integration and the use of the Internet in teaching activities also create the need to provide protection and prevention mechanisms for students due to inappropriate content that can be found on-line. To reduce these risks there is a need to increase the empathy between teachers and pupils, as well as greater openness to discussions about Internet activities and on-line pupils' lives.

Teachers need to integrate short, simple and attractive exercises in their teaching activities to help students internalize the concepts of online safety and responsible behavior that a digital citizen has to understand. A reference guide in this sense is the Guide for a safer Internet. https://oradenet.salvaticopiii.ro/docs/Ghidul_utilizarii_in_siguranta_a_Internetului.pdf. Knowing the risks in the online environment is the most important step in avoiding them.

- some IT corporations still demanding high costs for acquiring software licenses;
- moral wear of IT systems;
- lack of funding leading to a time lag between software supply and integration into the teaching process and to a disparity between the new IT applications and teachers training;
- changed educational practices with negative impact on the learners (i.e. decreased capacity for verbal expression, discussion, argumentation; decreased attention and concentration).



3.5 European recommendations and current national policies for ICT and innovating education

3.5.1 European recommendations

The participants 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.

3.5.2 National policies for ICT and innovating education

- **Strengths:**
 - Both policy makers and decision makers from national and local institutions as well as school directors and coordinators working on ICT integration think that current national policies are in line with the European recommendations. The most important regulations for the integration of ICT into the education system and teaching practices are considered to be:



- The Law of National Education, Law no. 1/2011 stipulating the introduction into the common trunk at gymnasium of a discipline (Informatics and ICT) that explicitly addresses (key) digital competences.
- School curricula for primary education, which provide for integrated teaching and correlation of technology with other disciplines.
- Professional standards/teacher evaluation sheet, which provide for the use of new technologies in teaching.
- The digital textbooks developed for primary education

Relevant excerpts from focus groups and interviews

“After consulting the educational systems of other countries, we have found that we are in line with European requirements. A range of POSDRU programs accessed in Romania have aligned us with European requirements. Thus, the INSAM project (Digital Instrument for Improving the Quality of Evaluation in Pre-university Education) aimed at developing and implementing digital tools and mechanisms to improve the evaluation and self-assessment/self-evaluation processes of students in high school pre-university education - respectively the creation of a platform with educational assessment items, and Key ICT skills in the curriculum promoted IT and ICT across all disciplines. The results of these programs are already seen in teaching practice across all disciplines.” (Marilena Oprea, Tudor Constantin)

National education policies have supported the development of pedagogical and methodological innovation through ICT through programs such as Teacher Training in the Knowledge Society: DeCeE, the Internet in your school that is a national project, or the INSAM (Digital Improvement Quality Assessment in Pre-University Education) aimed at developing and implementing digital tools and mechanisms. (focus group, Vrancea)

Two government initiatives are worth mentioning regarding the widespread application of digitization of school institutions and the didactic process: digital textbooks for primary education and the introduction of IT and ICT in gymnasium. There will be a need for qualified teachers for this discipline at the gymnasium, which so far has been optional discipline only in some schools. (Marilena Oprea, Tudor Constantin)



Government regulations for ICT integration in the education system and teaching practices such as the National Education Law in 2011 and the curriculum changes that have begun in recent years and are now in the process of being implemented, the introducing Computer Science and ICT subject at Gymnasium are also new opportunities for modernizing Romanian education. The revolutionary measure is the achievement of the current gymnasium curriculum, which is an innovative one.

Other two governmental initiatives worth mentioning as opportunities with large-scale application of digitization of school institutions and didactic process are: digital textbooks for primary education and the introduction of professional standards / teacher evaluation sheet, which foresee the use of new technologies in teaching.

Training courses, platforms, and educational resources are required because these programs are designed for school students to use the resources they have, programs that can be free or purchased.

Free educational resources must be provided on a timely basis by experts to teachers, because selection work requires work of research. Emphasis should be placed on didactic aspects and teaching methods. Educational policies should focus on how to implement this school curriculum in all schools in Romania.

■ Weaknesses:

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.

Also, to minimize discrepancies between schools in terms of human, financial and development resources and opportunities, free educational resources – training courses, platforms, educational software 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. (Marilena Oprea, Tudor Constantin)

3.6 Implementation process of ICT educational policies

As a pedagogical aspect of ICT integration in school practice, the following issues are considered relevant by the respondents:



- using the didactic strategies of tablet integration in the educational activity;
- creating lesson plans using your tablet and mobile phone for each discipline;
- selecting information available in electronic format for various didactic and extra-curricular activities (competitions, competitions, etc.);
- remote communication between teacher-student using tablet, smart-phone applications, accessing home learning resources to facilitate access to education for students with disabilities;
- a wide range of free applications that teachers, regardless of the subject they teach, can use in teaching-learning-evaluation activities: presentation and processing of digital photos, audio and video documents, linguistic games, etc.

Strengths

- Our respondents mentioned a series of funding programs that, in their view, supported the development of ICT resources and pedagogical and methodological innovation through ICT:
- The Digital Educational System (SEI). Is a program within the Romanian Government's strategy in the field of virtualisation and computer-aided education, being a complex measure initiated by the Ministry of Education in 2001 which lasted for around 10 years. The main objective of SEI was to support the teaching / learning process in pre-university education with the latest technologies. The program of introducing information technology into the Romanian educational system had two main components: one, oriented towards the transition to computer education, and the other, aimed at making education management more efficient and ensuring the transparency of educational processes, at all levels, by using tools IT support. The program included also a component of developing education software for high-schools on an eLearning Platforms (AeL).
- “Teacher Training in the Knowledge Society”, national program that aimed at regular training of ICT skills at ECDL-Complete level for all teachers in the education system.
- “The Internet in your school”, national project facilitating public access to modern means of communication for educational institutions in disadvantaged rural and small urban areas - by increasing the use of ICTs, supporting the connection to the Internet through broadband connection, and by strengthening the ICT infrastructure.
- INSAM (Digital Improvement Quality Assessment in Pre-University Education) aimed at developing and implementing digital tools and mechanisms to improve the quality of assessment in pre-university education.



- Communication and organizational programs regarding the relationship between governmental institutions (politicians, decision-makers, laws, etc.) and schools (executives, administration, teachers, pupils, etc.) seem to be well adjust.

Relevant excerpts from focus groups and interviews

"The best example of educational policy that has also worked is SEI - The Computerized Educational System. It was a coherent system developed after a well-established plan over a long period of time. SEI is the best example, it was awarded at the World Summit Award, the most important international forum about technology in education - SEI received the first prize for the best ICT integration project in education." (focus group, Iasi)

"There is a well-established communication system from hierarchical point of view, Ministry - County School Inspectorates - School and vice versa." (Marilena Oprea, Tudor Constantin)

"Better cooperation between decision-makers and school could be facilitated by more punctual meetings so teachers can be aware of what they have to do, the impact of technology on adults and students, emotional, moral and ethical component. Online communication is a reality: communication is both horizontal, between schools and vertically, between the Ministry of Education, County School Inspectorates and schools. Video conferencing improves the communication and understanding of the transmitted message, it can interrelate better. The use of e-mail, e-mail is a reality and at the level of Calarasi County there is a recommendation for the leaders and educational coordination to consult the e-mail three times a day. As a general inspector conclusion, the videoconferencing system should be extended to the communication between ISJ and schools." (Marilena Oprea, Tudor Constantin)

- Involvement from NGOs and business environment

A special role in the promotion of educational materials is provided by various NGOs promoting technology: ADFABER Romania (<http://adfaber.org>) - which promotes society's development and the social change through technology and had developed numerous educational programs and the Sigur.Info project, developed by a Consortium consisting of Save the Children Romania - National Coordinator, FOCUS - Romanian Center for Missing Children and Sexual and Positive Media. The project promotes a more secure use of Internet and new on-line technologies. Part of the project aims to help children, parents and teachers identify and disseminate useful, safe, and easy-to-use digital resources. At one point, Samsung has equipped some classes from different counties with tablets, interactive boards, TV, etc..



■ Weaknesses:

- Lack of systematic evaluations and comprehensive, integrative analyses;
 - National and systemic inventory of the current situation, from the manner in which policies are put into practice, the material and educational infrastructure, the external network of education/educational resources providers (NGOs, business etc.), the training network, the training beneficiaries - the teachers who have benefited from training and those who have not benefited, the practices and the implementing methods in schools, finding out the deficiencies, what works and what has not worked, the applicability of the implementation projects so far, collecting suggestions for improvement, including by collaborating with factors in foreign educational systems. The need for a national platform that integrates what already exists, with references to other existing software/platforms, that must be accessible to everyone, was also highlighted.
- Financial factors:
 - Poor infrastructure, material basis, funding were the most frequently mentioned problems identified by the school staff interviewed by us.
 - Although political measures have been taken to cover the material base, in reality these have not fully met their target, an important factor affecting the material basis is the degree of wear and outgrowth/overthrow given the fact that technology in this field is constantly upgrading. Moreover, the high cost of repairing devices or acquiring improved software versions is supported by schools, thus hampering access to a high performance base.
 - Speaking of digital textbooks, in rural areas not all children have access to a computer at home, on a tablet, not all children have a smart mobile phone to be able to use these digital textbooks.
 - So, although they are already considered priorities and intervention measures have been taken in these areas, disadvantaged pupils and discrepancies between rural and urban are problems that still need sustained interventions.

Relevant excerpts from focus groups and interviews

"I think it is time to stop and evaluate what has been done and get on with what we have. Otherwise, every time we take it from scratch. We have a lot of teachers trained and I think any teacher, if you give him a video projector, a laptop and open his software, can work in class without having any extra skills because the software help a lot. Much has been done - material and also, people have been formed. But we need to



see what has been done, seeing concretely, analyzing, seeing if there is a group of human resources in every school that can perpetuate these practices. Because not all the schools in Romania have trained teachers. It is very simple to see the participants in different courses, to see at what schools are now, to identify the schools that would need training.” (focus group, Iași)

“In September 2016, I participated in an experience exchange in France. I was impressed by a platform through which communication between school and family can be improved. I believe that such a platform is needed also in Romania. The frequency of pupils at school and the results of their assessments are computerized. Regarding the frequency, if a student is absent from school, when the teacher records the absence, the family is immediately notified and responds if they know it or not, if possible the community order organs are also announced.” (Marilena Oprea, Tudor Constantin)

“Educational platforms are scattered and often ephemeral. Effective management of their own educational resources is needed.” (focus group, Bucharest)

“We lack at national level a strategy that is accompanied by the allocation of sufficient funds for the development and purchase of software for the school institutions” (Marilena Oprea, Tudor Constantin)

“Must start with the facilities of the schools, the purchase of material resources (tablets, laptops, video projectors, digital board - for class.” (focus group, Vrancea)

“We want educational software, we want quality, modern means, computer science laboratories.” (focus group, Iași)

“The computer room has not been used for 10 years, and we have asked for a sponsorship from a city firm to equip it. At the primary school there is a smart TV in every class, but no Internet connection.” (focus group, Bucharest)

“There is a need for better policy implementation in school reality; it is not enough if there are certain issues on paper as schools face the lack of computers / Internet connection. This must be followed and implemented centrally.” (focus group, Bucharest)

“On the one hand, there should be facilities that are in line with the times and not only computers, but everything that is the material basis - digital textbooks. But to use the digital manual you have to think about



two things: on the one hand, the child can access it at home and on the other hand it can access it at school. This involves Internet connection, or tablets, or a computer available to each child. And, on the other hand - very important, there should be some guides for teacher use, integration of modern means in education, according to the times we live. Digital manuals exist, but important is what you do with it, how you integrate the use of this digital manual into classroom activity. And what does the child do with him?"
(Mihaela Tura, Iași)

"We are still deficient in everything from equipment or endowment category. And then there is no real integration of ICT in teaching as long as there are no means for that. Maybe you have a computer at home, but if you do not have a class in class ... There are schools where there is one projector video and it shares everyone. It's good that there is that one. What do we do when it is upset if there are no funds for repairs and endowments? And the Internet, even less. Not in all classrooms there is Internet, not all classrooms, there is a computer, a projector video." (Mihaela Tura, Iași)

"The main issues would be - on the same level - endowment and a teacher's guide to using and integrating these resources into teaching, with concrete examples - what I can do with them, where and for what I use them." (Mihaela Tura, Iași)

3.7 National specificity that is considered critical to be enhanced

Other aspects that constrain the acquisition and effective use of ICT competences can be consider systemic factors, in the sense that it's not strictly related with the integration of ICT and affects 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.

Relevant excerpts from focus groups and interviews

"It's also a matter of time, it depends on how much it takes to prepare a project, because besides being a teacher, you have a lot more tasks, countless tasks. So you prepare your project and you find

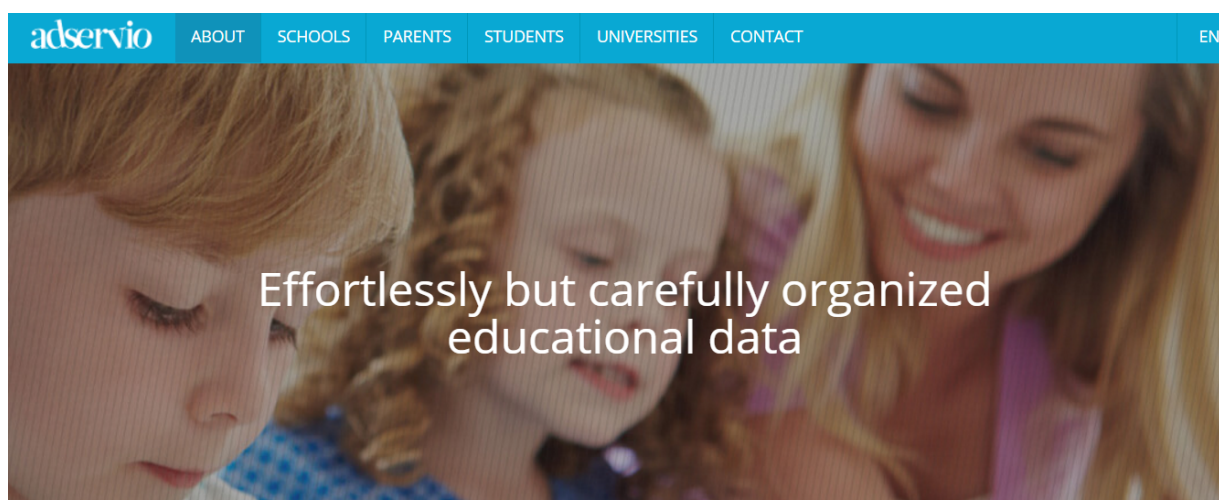


that you have no more time and you abandon it. There is bureaucracy.” (focus group, Iași)

“If you do not have to get a certain number of credits, people would be more motivated.” (focus group, Bucharest)

“For the teacher it should be a means to ease his work, not to enslave him more than he is.” (focus group, Iași)

Vasile Alecsandri High School was the first high school to implement the *Adservio platform*. It is useful and indispensable in communicating teachers with pupils, parents and soon with the educational partners at the level of Iasi Municipality. *Adservio* (<https://www.adservio.ro/despre-adservio>) has an intuitive interface and unlimited storage space and allows to quickly create groups and classes, allocate and correct themes, schedule control papers and theses, track student progress.



Emil Racoviță's National College, in partnership with the LERIS-related school foundation, has set up a LERIS program, targeting multiple activities such as school and professional orientation towards IT, training on different technologies or student contests, developed in Mixed teams of students and teachers, educational applications / software. All can be accessed from the school's website. To Emil Racovita National College, the *Adservio* system is supported by the parents' association that considers it as being an extremely useful tool. TIC is very well integrated in the teaching of various disciplines through presentations (Power Point, Prezi, etc.), projects and various applications. Each classroom is equipped with a video projector, teachers integrate in all ICT disciplines, even in sports, using educational software, digital textbooks.



The "Carmen Sylva" Gymnasium from Iasi mentioned the use of digital textbooks at the primary school, software for didactic games.

Digital technologies, in the view of the Pedagogical High School "Vasile Lupu", "fulfill their goals for which they were created, to inform the student in better manner, more attractive, or to provide the knowledge support when a reality is harder to understand" or for assessment.

Using AEL system to unload some lessons is used in teaching disciplines such as psychology, pedagogy.



As regards the level of transfer of the good practices and the factors that favor and constrain, financial shortages have been mentioned first; money favors, lack of money restricts.

The level of transfer of good practice is satisfactory. Training is promoted through use and enforcement of information protection legislation. Some of these were also presented at conferences (eg National Virtual Learning Conference).

The Hour Code had over 400,000 participants in Romania with impressive feedback from students, students, teachers and parents, <https://ro.code.org/>



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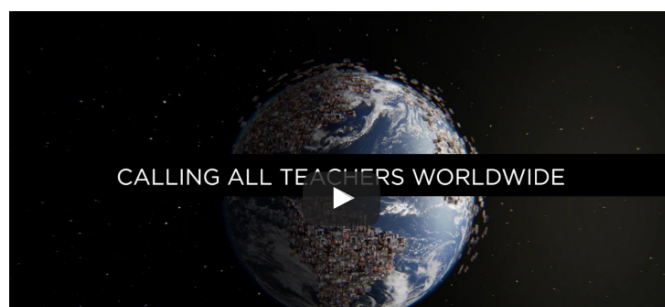
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1.656.942 din România au încercat Hour of Code



412.404.704

au încercat

Hour of Code

Oricine poate învăța

[Începe](#)

The Hour of Code is a global movement reaching tens of millions of students in 180+ countries. Anyone, anywhere can organise an Hour of Code event. One-hour tutorials are available in over 30 languages (<https://hourofcode.com/ro/gb>).

Code.org is a nonprofit organization dedicated to expanding education on computer technology and programming by promoting it in schools and increasing the participation of women and minority students. The program's vision is that every student in each school should have the opportunity to learn because computer technology and programming should be part of the core curriculum in education along with other science, engineering and mathematics courses (STEM) such as biology, physics, chemistry and algebra. The event coordinator for Romania is ADFABER - Technology for Social Change (<https://ro.code.org/about>).

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.

Collaborative skills are essential in teaching practice for improvement didactic act and professional evolution. At the same time, there is the opportunity for all teachers to develop basic skills in mathematics and science, which are essential in practicing this profession in the modern age we are crossing.

When talking about the opportunity to develop ICT skills, we mainly refer to

a) editing and storing documents (eg using GoogleDrive / Dropbox),



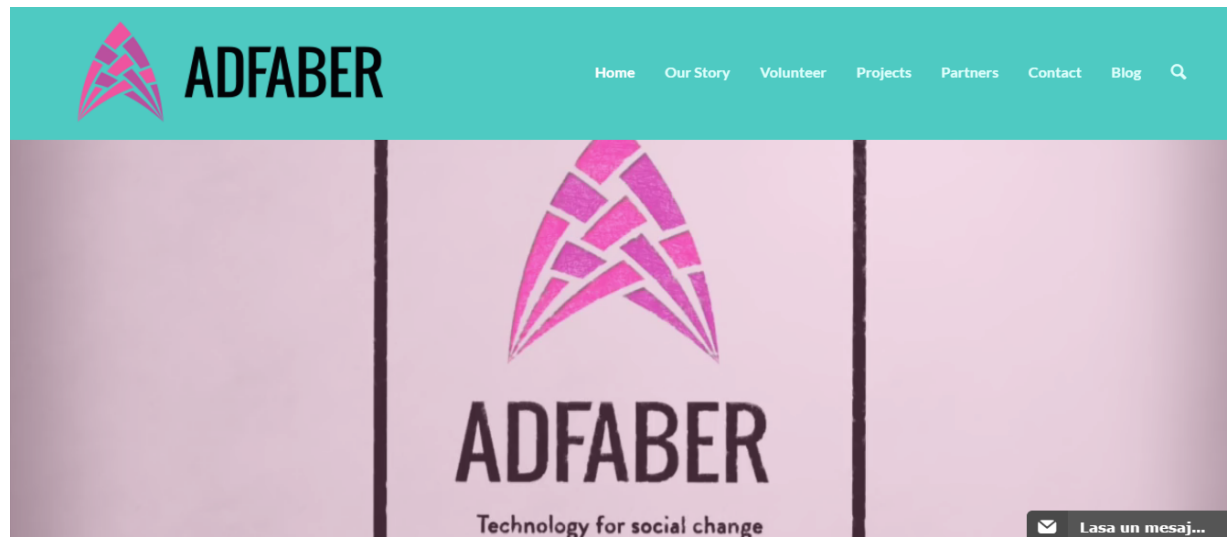
b) creating and editing presentation materials and videos, c) working with tables (eg Microsoft Excel),

d) html programming,

e) search for information on the Internet.

All this should be included in a training course on ICT for Teachers. Last but not least, there is a need for a partnership with pupils in articulating the didactic process. Opportunities created by on-line communication are a reality: communication is both horizontal between schools and vertically between the Ministry of Education, County School Inspectorates and schools. Video conferencing improves the communication and understanding of the transmitted message, it can interrelate better. There is a well-established communication system from hierarchical point of view, Ministry of National Education - County School Inspectorates - Schools and vice versa.

A special role in the promotion of educational materials is provided by the Institute of Educational Sciences and various NGOs that promoting technology. *ADFABER Romania* (<http://adfaber.org/>) - promotes technology with a lot of educational programs.



The *Sigur.Info Project* (<http://sigur.info/proiect-sigur.info/descriere-proiect-sigur.info/despre-proiect.html>) is being developed by a Consortium consisting of Save the Children Romania - National Coordinator, FOCUS - Romanian Center for Missing Children and Sexual and Positive Media, starting with September 2008. The project is part of the multiannual community program to promote of the using of the Internet and new on-line



technologies, in conditions of greater security, Safer Internet plus. This project is co-funded by the European Union, Safer Internet Program (<http://ec.europa.eu/saferinternet>). The project is developed through three main components: Activities of awareness and promotion of the safer Internet principles; A helpline for troublesome and harmful content on the Internet; A Hotline for reporting illegal content on Romanian web pages.

The aims of this project are:

- Raising awareness of the dangers and benefits of the online environment
- Managing a line of advice and a reporting line as a civilian contact bridge available for free to target groups.
- Providing to the general public with the information, resources and tools needed to create a safer and more responsible environment on the Internet
- Harmonization of Romanian legislation and working procedures with the European trends in the field, through collaboration between countries, private and non-governmental bodies



Projects developed through the Lifelong Learning Program and the *eTwinning Program* (<https://www.etwinning.net/ro/pub/index.htm>) are also opportunities to learn and exchange best practices for teachers.



Scientix (<http://www.scientix.eu/>) is another important resource for STEM teaching in pre-university education. A very useful feature is "Translation on demand" which allows the translation of any material in EU languages at the request of at least three people. Other resources are "space-awareness.org" and "SERO" of the European Space Agency.



The integration of ICT activities into the curriculum has also been integrated with projects such as the Open to the Universe, the *Erasmus+* or *Google for Education Program* (<https://edu.google.com/resources/programs/>), which offers the opportunity for schools, teachers and students to benefit from the latest knowledge and applications.



Programs for educators and students

The INSAM project (Digital Instrument for Improving the Quality of Evaluation in Pre-university Education <https://insam.softwin.ro/>) aimed at developing and implementing digital tools and mechanisms to improve the evaluation and self-assessment / self-evaluation processes of students in high school education. Exist the



opportunity of creation of a database platform with assessment items. More than, development of digital skills at curriculum level have promoted IT and ICT across all disciplines.



The INSAM project envisages the following target group: directors of the education units - deputy directors; Personnel with management, monitoring, evaluation and control functions from the school inspectorates, central and local structures of the MECT; staff from the national system of examination, assessment and curriculum in pre-university education; students (pre-university education). The proposed project aims to address problematic issues by providing an evaluation system accessible to all participants in the education process (student, teacher) and stimulating them in the process of education adapted to the needs of the labor market and the knowledge society.

Examples of projects, programs, educational software, platforms:

- History and society in virtual dimension
- Infoarena - <http://www.infoarena.ro/>
- Champion Edu- <http://campion.edu.ro/index.php>
- Pibinfo - Computer Problems- <http://campion.edu.ro/index.php>
- ERASMUS + - <http://www.erasmusplus.com/>
- Adservio Platform - <https://www.adservio.ro/>
- AEL Educational - <http://www.advancedelearning.com/index.php/articles/c3>
- INSAM (there is an INSAM database, but it is not public)
- Network One Education - <https://www.oneeducation.co.uk/>
- SIVCO- <http://www.sivco.ro/>



- SEI Portal - <http://www.portal.edu.ro/>
- Didactic- <http://www.didactic.ro/>
- Game software, gaming learning, auxiliary games
- School software: VERBUL- (C.N Emil Racoviță) - a grammar software of the Romanian language (indicative mode), another software ROMANTISM, a software ESSENTIAL ESSENTIAL, ARABIAN WORLD, NEWTON PRINCIPLE, CREATOR-SOFTWARE PROFESSOR. ([Http://racovita.ro/](http://racovita.ro/))
- Moodle Platform - <https://edu.moodle.ro/>
- EDU - www.edu.ro

3.8 Training teachers' digital skills

Teacher training system includes:

- Initial teacher training which is done through either the Departments for Teacher Training from each university organising 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 etc.
- 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.

3.9 School and teacher approach and perspective on ICT integration

Strengths

- Opinions regarding the teachers ICT skills are divided – some consider that there is a resistance of teachers in acquiring the necessary digital skills, but most believe that this kind of teachers are few and, in general, the awareness of the advantages offered by the new technologies, the need for adaptation and the desire to evolve are wide-spread and shared by school staff.

▪ Weaknesses:



- Reluctance and resistance to change, loosed mindset and lack of motivation;

Relevant excerpts from focus groups and interviews

„The digital age has brought many challenges, of which the teachers' ICT skills are first. Unfortunately, especially due to age, many do not have the necessary ICT skills.” (Cornelia Melcu)

„The school also faces a certain reluctance of the teaching staff towards the new and the acquisition of new skills.” (Cornelia Melcu)

- Lack of general standards for every school regarding ICT integration and evaluation;

Due to the large discrepancies between schools regarding the conditions inherent to ICT implementation, it remains mostly at the consideration of every school how much emphasis and how it chooses to understand TIC implementation.

Relevant excerpts from focus groups and interviews

„Changing learning practices remains strictly to the goodwill of teachers and schools.”
(focus group, Bucharest)

“I think it is important for a school institution to assume this in everything it does. In the evaluation sheet we have very clear details of the use of technology in classroom, and then each teacher knows he is also evaluated on this segment and he is trying to introduce more technology. So I think it's important that the institution to emphasize this direction.” (focus group, Iași)

- Superficial integration of ICT;

The way ICT integration is understood, the pedagogical strategies regarding ICT are variables with multiple meanings and choices, as long as there are no clear and rigorous standards.

Relevant excerpts from focus groups and interviews

“However, the teacher evaluation on this criterion depends on how you evaluate and what you think it means to really use technology. If the students just watched a movie without a working sheet... and they have an improvised discussion, does not mean that I am pleased with the performance with which the technology was used. If the student has a very clear sheet in front of him, he is told to focus on certain things, if after that he also



works on some materials, if that discussion is well prepared beforehand and it shows that it was clearly followed a thread, then I'm really pleased with how the technology was used. I can not be satisfied just because I saw a video projector, a laptop and a lesson with pictures.” (focus group, Iași)



4. Conclusions / results

The main and the most relevant results of the national research; the emerging key elements of the national context are:

- There are significant strengths to be further harnessed as in the last decade the education system reckoned a significant progress in what concerns teacher training, equipping schools with information and communication technology, developing support resources.
- However, good practices are not generalized, and there are also significant drawbacks given by the worn out devices, resistance to change of some of the teachers, inconsistency of policy measures.
- Proficient and innovative schools today need to demonstrate several attributes:
 - digitization of the didactic process;
 - correct and efficient use of technology;
 - higher digital literacy of all actors;
 - well equipped classrooms with modern technology;
 - effective IT technology use into administrative work;
 - access to new technologies and the transfer to the student, which involve ethical and moral aspects;
 - access of disadvantaged children to technology;
 - removing teacher reluctance towards the acquiring new skills.
- The main skills needed by teachers are: 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 hypothesis presented at the application phase regarding the macro-area of emerging skills were largely confirmed by the research results, the most important areas of skills development are
 - the socio-emotional (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); and
 - methodological skills (management of complex processes, planning and evaluation: Creating digital content needed in the knowledge society; Implementing management applications across all domains).

DECODE



Co-funded by the
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5. Methodological overview

The aim of the national report "Innovative training models, methods and tools for teachers in the digital age" was to provide a recognition of the main experiences, practices, methods and models which are relevant and innovative for teachers in the digital age. A qualitative methodology using focus group and in-depth interview with key actors were used. It focused on the exploration of the governance practices to understand the following areas of analysis:

- Innovative policies implemented;
- Significant experience spread;
- Classification of the profiles and skills of the operators of educational institutions in the field of ICT;
- Best practices and educational successful methodologies, for training teachers to facilitate their integration of ICT in educational context and and processes.

Sample of research:

- Focus-groups with 24 headmasters and school leaders: centred on strategic analysis, assessment of educational environments and experiences of integrating digital technologies in the educational practices:
 - Focsani – 8 participants;
 - Iași - 10 participants;
 - Bucharest – 6 participants
- 5 stakeholders and experts in the field of ICT in education were involved in in-depth interviews focused on identifying relevant aspects of the national context conditioning the ICT integration in education process.

1.1 Focus group

The Focus group involved participants with the following profile: school leaders, head masters (management staff and coordinators). The three Focus groups sessions involved from 6 to 10 participants each. Focus Group guides were provided for the organisation of the sessions, were theoretical principles to be observed were indicated. As a data collection method, focus groups are generally used to collect data on a specific topic



through a semi-structured group interview process. Focus groups sessions were moderated by group leaders. The focus groups were conducted using the Questioning route method, a method that is often used in academic research. The focus group structuring was high as the control of the discussion, through a structured path in which the moderator developed articulated and detailed questions. The type of questions were divided according to the degree of exploration to be achieved by alternating open questions to which participants respond verbally, using a list of written responses, rating scales.

Characteristics of focus groups

The design of the focus group research varied based on the studied research question. The general principles taken into account were:

- ☐ Standardization of questions. Focus groups can vary in the extent to which they follow a structured protocol or permit discussion to emerge.
- ☐ Number of focus groups conducted, or sampling will depend on the 'segmentation' or different stratifications (e.g. age, sex, socioeconomic status, health status) that the researcher identifies as important to the research topic.
- ☐ Number of participants per group. The rule of thumb has been 6-10 homogeneous strangers, but there may be reasons to have smaller or larger groups.
- ☐ Level of moderator involvement. Can vary from high to low degree of control exercised during focus groups (e.g. extent to which structured questions are asked and group dynamics are actively managed).

The purpose were to:

- ☐ explore new research areas, topics that is difficult to observe (not easy to gain access); sensitive ones or that does not lend itself to observational techniques (e.g. attitudes and decision-making);
- ☐ collect a concentrated set of observations in a short time span;
- ☐ ascertain perspectives and experiences from people on a topic.

Timeline

A initial database of possible contacts were developed and then confirmation were asked for the participation in the three proposed sessions (Bucharest, Iași, Focșani). The started several weeks ahead of the actual session (6-8 weeks). The focus-group grid was validated on two school leaders matching the profile of the target group.



Recording focus group data

One of the challenges in recording focus group data was to identify the speaking persons at any particular time, since often multiple people speak in overlap. The following suggestions were considered in the organisation of the sessions and making the transcripts:

- ☐ audio recording of the sessions. Recordings also provide access to nuances of the discussion and the ability to replay sessions during analysis. Video recording was discarded as an option.
- ☐ We have provided teams of 2 researchers (including the moderator) who attended the focus group and took notes.

Benefits of focus-groups

- ☐ Ability to produce a large amount of data on a topic in a short time
- ☐ Access to topics that might be otherwise unobservable
- ☐ Can insure that data directly targets researcher's topic
- ☐ Provide access to comparisons that focus group participants make between their experiences. This can be very valuable and provide access to consensus/diversity of experiences on a topic

Identification of the participants

- ☐ Determine how many participants and who they are
 - ☐ 1 group = 10 participants
 - ☐ Headmasters, school leaders, management staff and coordinators working on ICT integration
- ☐ Develop a list of key attributes to seek in participants based on the purpose of the focus group
 - ☐ Headmasters, school leaders and staff involved in the integration of ICT in regular teaching activities, with a broad knowledge in the fields of ICT and didactics, proven experience and expertise at high operational level, experience in the development of innovative plans, knowledge in the fields of learning management and classroom activities
- ☐ Using the list of attributes, select the participants

All information from the Focus groups were treated as confidential.

1.1 In-depth interviews

5 deepening interviews were organised with experts from three different areas (Bucharest, Iași and Vrancea). While the focus groups discussed issues related to the integration of ICT in education from an institutional



perspective, the deepening interviews focused on relevant issues on the topics on local and national level. The five policy/decision makers from Romania were interviewed with the aim to evaluate the steps taken by relatively governance integration of ICT in education system and teaching practices.

The semi-structured deepening interview method

The organisation of the deepening in interviews to key actors (policy makers, decision makers, institutional representatives), were supported by specific guides indicating the theoretical principle to moderator/observer to realize interviews.

The identified focus were an exploratory one addressing both:

- ☐ the respondent's opinion (about nature, causes, solutions of the analysed phenomenon);
- ☐ respondent's tangible experiences of the phenomenon.

The used tool was the semi-structured Interview.

Purpose of the tool

Generally, purposes are:

- ☐ obtain specific quantitative and qualitative information from selected respondents;
- ☐ obtain general information relevant to specific issues (ie: to probe for what is not known);
- ☐ gain a range of insights on specific issues.

What is the specific purpose of the interviews?

Purpose of this tool was to design a focused interview framework with key actors (policy makers, decision makers from national and local institutions etc.), as indicated in the template for national research.

Interviews aimed to understand, analyse and evaluate the following topics:

- ☐ national education policies in terms of digital challenges;
- ☐ the steps taken by relatively governance integration of ICT in education system and teaching practices;
- ☐ managing digital challenges in education system with a special focus on european recommendations related to development of skills in the digital era.

Characteristics of semi-structured interviews:



- ❑ The interviewer and respondents engage in a formal interview.
- ❑ The interviewer develops and uses an interview guide: a list of questions and topics that need to be covered during the conversation, usually in a particular order.
- ❑ The interviewer follows the guide, but is able to follow topical trajectories in the conversation that may stray from the guide when he or she feels this is appropriate.

Semi-structured interviews were conducted with a fairly open framework which allowed for focused, conversational, two-way communication. They were used both to give and receive information. Unlike the questionnaire framework, where detailed questions are formulated ahead of time, semi-structured interviewing started with more general questions or topics. Relevant topics were initially identified and the possible relationship between these topics and the issues such as availability, expense, effectiveness become the basis for more specific questions which did not need to be prepared in advance. Not all questions were designed and phrased ahead of time. The majority of questions were created during the interview, allowing both the interviewer and the person being interviewed the flexibility to probe for details or discuss issues. Semi-structured interviewing were guided only in the sense that some form of interview guide, such as a matrix is prepared beforehand, and provides a framework for the interview.

The script was not too long: most in-depth interviews lasted for less than 90 minutes, especially as the respondents received no compensation. Many senior managers were unable to spend more than half an hour, which means that we tried to have the interviews very focused and efficient. Respondents were prepared for the running of the in-depth interviews. Confirmed the interview (time and place) in writing, and were provided a general outline of the issues to be reviewed in advance. Some of the initial confirmations from high national or local officials were not eventually honoured.

Conducting the interview

After introductory pleasantries, the main purposes of the research project, the role that the interview plays, the approximate time required to complete the interview were presented.

The respondent were encouraged to do 90% of the talking. Moderators tried to return to incomplete points. If the respondent did not provide full information the first time a question is posed, he return to incomplete points by repeating key questions throughout oblique references.



Questions followed a general to specific order. The aim was to assure neutrality by avoiding agreeing or disagreeing with the respondent, avoiding indicating that a respondent's answer is 'good', 'right', 'interesting', 'wrong' or 'poor'.

Recording semi-structured interviews

The interviewer had a paper/web-based interview guide that he or she follows. Since semi-structured interviews contained open-ended questions and discussions diverged from the interview guide, The interviews were recorded and later transcribed for analysis.

Permission to record an interview was asked, and if the interview is taking place in person, have the recorder in plain view.

Benefits

Many researchers like to use semi-structured interviews because questions can be prepared ahead of time.

They can provide reliable, comparable qualitative data; they can confirm what is already known but also provide the opportunity for learning. Often the information obtained from semi-structured interviews will provide not just answers, but the reasons for the answers.

Semi-structured interviews also allowed informants the freedom to express their views in their own terms. They are less intrusive to those being interviewed as the semi-structured interview encourages two-way communication. Those being interviewed can ask questions to the interviewer. In this way semi-structured interviews can also function as an extension tool. When individuals are interviewed they may more easily discuss sensitive issues.