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**REPORT ON POSSIBLE SYNERGIES BETWEEN INFORMATION AND COMMUNICATION
TECHNOLOGIES AND ADULT EDUCATION IN ITALY**

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Summary

INTRODUCTION	3
I. INFORMATION AND COMMUNICATION TECHNOLOGIES IN ADULT EDUCATION.....	4
II. EUROPEAN CITIZENSHIP, INTEGRATION AND DEVELOPMENT OF TRANSVERSAL SKILLS	10
III. INTERACTIVITY AND INTERDEPENDENCE BETWEEN ADULTS AND MEDIA	17
IV. CRITICALITY AND DEVELOPMENT PROSPECTS	23
V. MAIN FORMAL AND INFORMAL INFORMATION CHANNELS	28
In Europe	28
In Italy	32
VI. STRENGTHENING POSSIBLE REGULATORY AND PRACTICAL SYNERGIES.....	34
CONCLUSIONS	37
BIBLIOGRAPHY AND SITOGRAPHY	39



INTRODUCTION

The technological revolution that humanity is currently experiencing is largely due to the significant progress made by Information and Communication Technologies (ICT).

The impact of digitalisation on society is evident and increasingly widespread. The great changes that essentially characterize this new society are given by the generalization of the use of technologies, communication networks, rapid technological/scientific development and the globalization of information.

Digital is today the leading sector of the world economy and therefore every country is required to guarantee citizens access to technologies, provide the tools for the dissemination and learning of digital skills and raise public awareness of the need to develop a digital culture.

In this paper we will analyze the role that Information and Communication Technologies (ICT) have today in adult education together with the common objectives set by the European Union, in particular by the New European Agenda for Adult Learning 2030 touching on issues such as active citizenship, integration and inclusion and the development of transversal skills. Then the interactivity and interdependence between adults and media will be treated with the relative criticalities given above all by the *digital divide*. To conclude, the main formal and informal information channels will be identified both in Europe and in Italy together with the strengthening of possible synergies at a regulatory and practical level.



I. INFORMATION AND COMMUNICATION TECHNOLOGIES IN ADULT EDUCATION

The term Information and Communication Technologies, often referred to as TIC in Italian and ICT in English, refers to a complex of technological developments (such as digitization, broadband, optical fibers, satellite communications, wireless, and so on), developed in recent decades and constantly evolving, which have allowed the creation of "new technologies" in terms of devices and networks (such as the computer). multimedia connected to the Internet, mobile phone connected to radio link networks, digital television connected to satellite network, and many others), as well as related usage programs.

For their massive diffusion as consumer objects, but also for their computing and data transmission capabilities (think, for example, of scientific research and engineering design), these technologies are attributed the ability and merit to profoundly transform ways of life, work environments, ways of learning, the spaces of daily life of most of the inhabitants of the planet. However, beyond the most immediate and perceptible changes in daily behavior, it remains largely undetermined whether, how, to what extent and in what direction this transformation can and should occur. It goes from visionary and optimistic forecasts to prudent and possibilist assessments, up to fears for the potential for social control that these technologies make possible or alarms for the spread of antisocial and pathological behavior.

Since the nineties, school systems and, more generally, training systems have been at the center of an international and European debate aimed at defining a sort of strategic relocation of schools and training in the context of significant economic (globalization), technological (TIC), cultural (the multicultural and planetary scenario) changes underway. Among the priority objectives that have emerged, and then variously taken up in the European agreements and national implementation plans, we find: giving priority to basic education; opening up the prospect of lifelong learning; developing the decentralization and autonomy of educational institutions; launching development-



oriented curricular reforms personal skills; develop new technologies as a resource for teaching and as a tool for distance learning for adults. These objectives can be summarised in "preparing for the European Information Society" as a means of combating unemployment. This has resulted in a series of actions to be carried out at educational and training level in order to guarantee everyone the right to initial training and lifelong learning. The policies resulting from these guidelines have been mainly oriented towards bringing the school closer to the company, to integrate new technologies into daily teaching at all school levels and to activate continuous training courses for adults. Therefore, in the "knowledge society" the actions to be implemented are indicated by:

- The increase and diffusion of general culture, which allows us to grasp the meaning of things, to make decisions, to make evaluations and above all to learn to learn;
- The promotion of the development and acquisition of new knowledge, through policies aimed at increasing research and training standards;
- The development of individuals' attitudes to work and activity, through greater flexibility and mobility;
- The growth and recognition of skills acquired in school and learning paths;
- Investment in research on multimedia educational software, useful to allow a better and more profitable integration of new technologies in schools.

At European level, we have previously mentioned the Recommendation of the European Parliament of 2006 (then taken up in 2018) called "Recommendation on key competences for lifelong learning". The fourth of these competences is digital competence defined as "*knowing how to use, with familiarity and critical spirit, information society technologies (IST) for work, leisure and communication. It is supported by basic skills in ICT (Information and Communication Technologies): the use of computers to retrieve, evaluate, store, produce, present and exchange information as well as to communicate and participate in collaborative networks via the Internet.*" This area of expertise is characterised by specific knowledge, skills and attitudes. Below is an analysis of knowledge, skills and specific attitudes:



- Knowledge-> Digital competence presupposes a firm awareness and knowledge of the nature, role and opportunities of IST in everyday life, in personal and social life as well as in work. This includes the main IT applications such as word processing, spreadsheets, databases, information storage and management as well as an awareness of the opportunities offered by the Internet and communication via electronic media (e-mail, network tools) for leisure, information sharing and collaborative networks, learning and research. People should also be aware of how IST can assist creativity and innovation and be aware of issues related to the validity and reliability of available information and the ethical principles that arise in the interactive use of IST.
- Ability-> L and necessary skills include the ability to search, collect and process information and to use it critically and systematically, ascertaining its relevance and distinguishing the real from the virtual while recognizing its correlations. People should also be able to use tools to produce, present and understand complex information and be able to access, search and use internet-based services; they should also be able to use IST in support of critical thinking, creativity and innovation.
- Attitudes-> The use of IST involves a critical and reflective attitude towards available information and a responsible use of interactive media; an interest in engaging in communities and networks for cultural, social and/or professional purposes also serves to strengthen this competence.

It is, of course, a competence of its transversal nature, as it not only allows the development of other key competences, but tends to characterize them (e.g. mother tongue, mathematics, learning to learn, expression and cultural awareness). This is why it comes into play in many of the skills needed by citizens to be able to participate actively in social life and economic development.

In order to respond to the need to reach a shared language and a common meaning of the concept of digital competence and its constituents, in 2013 the "*Mapping Digital Competence: Toward a Conceptual Understanding*" was developed within the European project DIGCOMP, where the results of a survey carried out among international experts are presented: twelve areas or areas that



identify the qualities of a person defined as digitally competent. Below are the twelve areas that emerged:

1. The digitally competent person knows the fundamental principles (terminology, navigation, functionality) of digital devices and knows how to use different ones (for example, desktop PCs, laptops, tablets, smartphones). Possesses general computer skills (digitization, computer use, entry into a new program) and understands the difference between hardware and software. He is familiar with the meaning of the terms commonly used in user manuals for operating a hardware, installing and configuring software. He knows about the existence of several operating systems.
2. It is able to integrate information and communication technologies into the activities of everyday life. In particular, it can download and access different types of information on the Internet; Use applications to edit and create content (textual, numerical, iconic). It is able to search, collect, process, evaluate, share, store data and information using various devices, applications, cloud services. Can carry out various types of online transactions (for example, pay invoices, apply for a job, submit a declaration, complete forms, book a hotel, interact with local or government services, make online purchases, etc.). Consult digital resources as a routine resource (for news, health, sports, travel, entertainment, etc.).
3. They are able to use ICT to improve the quality of their professional performance or, at a higher level, master the specialist digital skills needed for their field of work. Create representations of knowledge (using, for example, maps and diagrams) and use a variety of languages to express themselves creatively (text, images, audio and movies). It is able to modify an existing content transforming it into a new product.
4. The digital competent person is able to connect, share, communicate and collaborate with others effectively in digital environments. In particular, he knows how to use ICT for group work (collaboration, co-construction of content) and for remote work. Can communicate through e-mail, instant messaging, video conferencing, etc.; He is able to use social media and participatory technology and knows how to use digital media to be part of a community. It is able to reap the



benefits offered by digital technology both in terms of collaboration and participation in networks, and in that of learning for both personal and professional purposes.

5. It uses technology to improve its ability to collect, organize, analyze, evaluate the relevance and purpose of digital information. It is able to judge the validity of a content present on the Internet, to find appropriate materials and to evaluate what can be considered reliable. Can integrate information, put together different types of information, compare it with information from different sources (triangulation of information) before using it in a cognitive process. It is able to structure, classify and organize digital information/content according to a scheme.
6. It has the ability to protect personal data and to take appropriate security measures. It understands the risks associated with using online and meeting strangers. You are aware of the privacy issues involved in using the Internet/Mobile Internet and are able to act prudently. Can protect itself from threats from the digital world (fraud, malware, viruses, etc.), understands the risk of identity theft and access credentials and is able to take measures to reduce these risks. He knows that many interactive services use the information provided to filter commercial messages in more or less explicit ways.
7. Behaves appropriately and in a socially responsible manner, demonstrating knowledge and awareness of the rules and ethical aspects related to the use of ICT and digital content. Specifically, it is able to communicate and collaborate online with others by adopting a code of conduct appropriate to the context. It takes into account the regulations and ethical principles related to the use and publication of information. Understands copyright rules and licensing rules and knows that there are different ways of distributing a work and different license that protect intellectual property and the assignment of copyright; understands the differences between copyright usage, public domain licenses, copyleft, and/or Creative Commons licenses.
8. Demonstrates a balanced (positive but realistic) attitude towards the benefits and risks associated with information technology. It informs, explores and takes advantage of the possibilities offered, looking at digital media as factors of facilitation and not inhibition, and considering them tools that should be at the service of improving the lives of human beings (and



not the other way around). It is able to assess and reduce/avoid technological threats affecting health.

9. It encompasses the wider context of use and development of ICT, its role in everyday life, society and work, in an era characterised by globalisation and networks. He is aware of general trends within new media, even if he does not use them. He realizes that behind the technologies there are production companies, there are developers and there are also purposes. It is aware of the environmental problems associated with their use.
10. The person with digital competence actively and constantly explores emerging technologies, adapts to them, integrates them into their environment and uses them for lifelong learning (formal or informal). They are able to use ICT resources to safely expand their knowledge and connect with the world around them. He is able to learn to work with any new digital technology he finds externally but also to draw on his own inner resources.
11. It is aware of which are the most relevant and common technologies and is able to choose the most appropriate one depending on the purpose or need under consideration. It is able to use digital services without being completely dependent on them.
12. He uses digital technologies with familiarity and creativity to increase personal and professional effectiveness and efficiency. Can use different ICTs in order to achieve better results, faster, or more easily. It is able to take advantage of the most efficient and cost-effective digital equipment. It is able to solve a theoretical or practical problem, individual or of collective interest with the help of digital tools.



II. EUROPEAN CITIZENSHIP, INTEGRATION AND DEVELOPMENT OF TRANSVERSAL SKILLS

Previously, the notion of adult education, which refers to a wide range of formal and informal learning activities, both general and vocational, undertaken by adults after leaving initial education and training, was discussed.

Adults can undergo training for many different reasons:

- Improve their job prospects;
- Continue personal or professional development;
- Gain transferable skills, such as critical thinking.

Adult education also contributes to improving social cohesion and promoting active citizenship, and also strengthens the competitiveness of European businesses and economies. The recovery from the Covid-19 pandemic and the green and digital transitions have accelerated the pace of change in the way we live, learn and work. Citizens need to update their knowledge, skills and competences to bridge the gap between the education and training they receive and the needs of a rapidly changing labour market.

The right to education, training and lifelong learning is enshrined in the European Pillar of Social Rights (Principle 1). In line with the headline target of the Action Plan on the European Pillar of Social Rights, 60% of adults are expected to participate in training courses each year by 2030. Too few people in Europe regularly undergo training after initial education. Actions and initiatives at European level support the efforts of national institutions and individuals to increase adult participation in learning and training activities. They aim to improve the response to adult education challenges and to foster the exchange of knowledge and experience between countries.



The Resolution adopted by the Council of the European Union on 29 November 2021 entitled 'Council Resolution on a new European Agenda for Adult Learning 2021-2030' underlines the need to significantly increase adult participation in formal, non-formal and informal education.

The New European Agenda for Adult Learning outlines how adult learning should develop in Europe by 2030 in the following five priority areas:

1. Governance of adult education with a strong focus on administration-wide national strategies and on collaboration between stakeholders;
2. Provision of and participation in lifelong learning opportunities with sustainable funding;
3. Accessibility and flexibility to adapt to the needs of adults;
4. Quality, equity, inclusion and successful adult learning outcomes, with an emphasis on the professional development of adult learning providers, learner and staff mobility, quality assurance and active support for disadvantaged groups;
5. Green and digital transitions and related competence needs.

Below is an analysis of the five sectors:

11

1. Governance

Partnerships between governments, regional and local authorities, education and training providers, businesses, social partners, public employment and social services as well as with civil society are a necessity and are closely linked to the shared responsibility of all parties involved. This responsibility includes, inter alia, tasks such as analysing education and training needs and developing adult learning opportunities, optimising the involvement of and cooperation between all stakeholders, raising awareness and dissemination, and supporting the provision of sufficient guidance and advice to providers and businesses. It is necessary to strengthen the framework conditions for cooperation on adult learning needs: seek to develop a comprehensive approach to adult learning that includes all types, forms and levels of adult education and training as well as other relevant forms of learning opportunities and clarifies the roles of all sectors concerned. Such an approach should allow for cross-sectoral monitoring, as well as inter-ministerial and cross-sectoral partnerships leading to policy



coherence. As part of lifelong learning, it could also result in adult learning strategies and national skills strategies based on research, empirical evidence and data. Cooperation and partnership between stakeholders at national, regional and local level should meet the needs of adult learners and employers, including, where possible and depending on national circumstances, effective and efficient funding of adult learning initiatives.

2. Provision and dissemination of lifelong opportunities

It is essential to raise awareness among adults of the importance of learning as a lifelong commitment to be pursued at regular intervals throughout life. Adult learning should become more personalized. It should be encouraged and supported through effective lifelong guidance systems with awareness-raising activities, as well as through integrated systems for the validation of prior learning. Existing skills forecasting systems (skills needs analysis) should be available to all stakeholders to support lifelong guidance and adult learning planning. Where appropriate, the integration of financial incentives, tax incentives and other social benefits or compensatory measures at employer level in the framework of the implementation of adult learning policies should result in an increased employer's commitment to adult learning. Sustainable public funding should be complemented by other funding at various levels (European, national, regional, local, employer, individual), for all types, forms and levels of adult learning. Efficient allocation and use of funds is crucial and must be adapted to individual learning needs. In this respect, the monitoring of expenditure plays an important role.

12

3. Accessibility and flexibility

Adult learning should be flexible in terms of duration, place, resources, forms of organisation and implementation and should include a variety of approaches and measures to increase participation, inclusion and motivation to learn. It should allow enrolment not only in different levels of formal education and training but also in other programmes, including non-formal ones, aimed at reskilling and upskilling, together with a broader learning paradigm. To



reconcile family, private and professional responsibilities, flexibility is essential for more adults to embark on and continue learning paths. Adult learning must offer high-quality programmes, regardless of whether funding is public or private. Education and training programmes offered in the context of adult learning should be based on the previous knowledge, skills and competences, experience, preferences and specificities of individual learners, based on the needs and possible outcomes of their self-assessment and with particular attention to vulnerable groups. An educational and learning approach that encourages adults to express affinities, wants and needs is inclusive and motivates adults to train and improve themselves, while providing opportunities for personal and professional development, community learning, intergenerational learning as well as in relation to other social aspects. Adult learning should also facilitate the acquisition and strengthening of knowledge, skills and competences, thereby contributing to ensuring more inclusive societies and equal opportunities, depending on specific circumstances and socio-economic context, paying particular attention to vulnerable groups. Consideration should be given to introducing other financial and support measures, as well as concrete actions to support learners, for example in the form of financial incentives, such as loans, grants and tax relief. Evaluating the concept and use of micro-credentials can help broaden learning opportunities and could strengthen lifelong learning by offering more flexible and modular learning opportunities and more inclusive learning pathways.

13

4. Quality, equity, inclusion and success in adult learning

Professionalization

There is a need for professionalisation and capacity building of adult educators and trainers, including practitioners (e.g. mentors, tutors) and other professionals involved in support activities such as guidance, validation, dissemination, awareness-raising, leadership and management in adult learning. The definition and validation of the key competences of adult learning professionals could provide added value. Professionalisation in adult learning is



essential for the quality of education and training offered (e.g. in addition to content-related skills, adult learners need to acquire social and digital competences, for which a different/appropriate approach to teaching is needed). Adult educators and trainers should be supported in the implementation of competence-based teaching and learning, including through counsellors and peer learning activities. A well-developed network and partnership between adult learning providers and other partners offering learning opportunities could make adult learning more accessible and economic and time issues to be a less insurmountable obstacle than in the past.

Mobility

The mobility of adult learners, adult educators and trainers and other adult learning stakeholders should continue to be expanded as a key element of European cooperation and a tool for improving the quality of adult learning and promoting multilingualism in the Union E Europe. Further efforts should be made to remove existing barriers and barriers to all types of teaching and learning mobility, including, inter alia, issues of access, guidance, student services and recognition of learning outcomes.

14

Inclusion

Adult learning is important to promote gender equality and solidarity between different age groups, cultures and people from all backgrounds, as well as to promote democratic citizenship and the EU's fundamental values; In this context, vulnerable groups deserve special attention. Adult learning resources in education and training should be allocated in a balanced manner. Funding models based on shared responsibilities and strong public engagement should be considered, especially in relation to target groups of adults who come from a disadvantaged background, have disabilities or are exposed to other factors that may lead to exclusion. Incentives should be considered to remove barriers to the participation of all target groups in adult learning, such as lack of time to study, low basic skills, poor professional skills, inaccessibility, low levels of motivation and negative attitudes towards



learning. Cooperation with stakeholders is essential to return disinterested adults and specific target groups to learning. Intergenerational learning, which also involves the age group of over sixty-five, can be useful to promote well-being and active, autonomous and healthy aging.

Quality assurance

Quality assurance of adult education and training providers and their systemic partners should be further strengthened where appropriate. Monitoring the outcomes of adult learning provision can improve quality assurance. Education and training should be more learner-centred and could provide short learning experiences aimed at acquiring or updating specific skills. The continuous development of monitoring, evaluation and quality methods is essential to ensure that learning outcomes are evaluated and that there are prospects for improvement. In order to support the quality of adult learning, national and regional systems or models, including validation and recognition of prior learning, should aim to develop and deliver internal and external quality assurance.

15

5. Green and digital transitions

The dual transition (green and digital) acts as an engine of innovation in learning paths and in new educational and training approaches, also with regard to learning environments. These innovations must ensure permeability and flexibility between the various forms and levels of adult learning. The green and digital transitions require all generations to develop the necessary green and digital skills (increased media digital literacy and environmental awareness) to work and live proactively in a digital environment. Digital learning (integrated, hybrid, etc.) also requires the professional development of adult educators and trainers, as well as support for the use of digital tools and the adaptation of teaching materials, approaches and resources. Develop approaches to integrate sustainable development into adult learning, including addressing environmental attitudes, developing an appropriate mindset, raising awareness and considering the appropriateness of taking specific measures



to develop training. The acquisition of knowledge, skills and competences in adult learning should be an important component of the ecological transformation process. Green skills, i.e. those needed in a low-carbon economy and society, will be needed for society as a whole and the workforce (in all sectors and at all levels), as emerging economic activities create new (or renewed) jobs and an effort is underway to achieve a sustainable lifestyle. Additional support for the opening up of learning environments will accelerate the digital transformation or improve existing infrastructure/initiatives, for example by promoting inclusive, digital and sustainable societies and learning workplaces. Such environments should improve equal access to digital material for adult learners of all ages and should support the safe use of digital technologies. Learning platforms for the public good should be designed to offer motivational support, professional mentoring, guidance and advice to participants.



III. INTERACTIVITY AND INTERDEPENDENCE BETWEEN ADULTS AND MEDIA

Recent educational and didactic research has increasingly shown that the use of ICT in education systems favours the improvement of learning and above all the process of learning to learn, which has assumed so much importance in the pedagogical reflections of recent years as an essential element in educational and training paths. The Internet can also facilitate the integration of ICT in the design and implementation of educational activities and paths. For just over a decade, in fact, the rapid and exponential development of the web has imposed the entry of the network and telematics into education systems. It is also true, however, that the approach to these new "tools" has not been easy nor can it be declared "concluded" and in any case positive and productive. In fact, the use of telematic systems in education does not always guarantee an improvement in learning processes and the performance of those activities based on cooperative environments and strategies aimed at increasing the motivation and involvement of participants, as fundamental elements in the design of educational curricula. Didactic planning must indeed provide for the transmission of knowledge in an individualized form, but also that the subject can experiment with experiences of production of knowledge starting from the enhancement of the points of view of the individual. In these reflections we usually tend to bring into play ICT as important tools for both directions and for their integration. Most of the reflections on this subject try to highlight the potential offered by ICT as a support for knowledge building processes through "research" activities carried out by individuals or groups.

17

The uses of IT tools range from considering them as cognitive tools (for example the use of the PC to write, rework and interact with the knowledge system) to the exploitation of the great possibilities of social interaction (chat, forum, blog, etc.) that they have in themselves. Although these considerations are now widespread in educational environments, unfortunately in educational practices still too often the use of ICT is reduced to a vehicle of facilitated and "captivating" information. Instead, it is desirable that new technologies be critically chosen to decide their use in educational and training environments. That is, the teacher and trainer must be allowed not only to critically choose the right tool (in terms of hardware and software, in this case), but also to decide



how (reference teaching model), when (use dosed between old and new tools) and why (what objectives to be consciously achieved) to use new technologies, without allowing them to guide educational practice.

In the knowledge society, pedagogical and didactic reflection does not only require the greater dissemination of information and learning. What is emphasized by many is the need not to limit the knowledge and knowledge to be transmitted and disseminated to the dimensions related to the economy and the market, but also to recognize those components of knowledge more "humanistic" (artistic, literary, aesthetic) as they are also essential components in the processes of learning and individual development. Another important aspect to consider is the fact that education must allow both the achievement, by all, of the knowledge culturally considered fundamental, and to experiment with personalized paths of construction of new knowledge starting from experience and one's own subjectivity. The dimension of the use of new technologies to make the most of their potential should not be overlooked, without neglecting the superiority of the pedagogical and didactic model over the purely technological one (of the ends over the means). These are the assumptions of the problematic pedagogical and didactic model that introduces the idea of complexity in educational practice and undertakes to enhance the coexistence of different pedagogical hypotheses that can be combined in a polyvalent logic both in terms of cognitive learning and in terms of socialization.

18

New technologies can be used as tools to activate experiences that put the subject in contact with the world and stimulate the ability to express oneself and discover in an original, creative and oriented way to understand the other. In this direction, all electronic tools that can expand the aesthetic perception of the individual are to be privileged, functioning almost as a "perceptual prosthesis", for example programs to build sounds and images, virtual and simulation environments, etc.

The systematic integration of new information and communication technologies into training and educational actions requires important pedagogical considerations. Very often the reflections and debates in this regard aim to argue the use of new technologies and the Internet as tools that must be accessed and that must be used more and more and by ever wider sections of the population.



Often, however, these recommendations direct educational research and the training of trainers, teachers, young people and workers towards objectives linked only to the competitive economic development of the world of industry and services. Defining contemporary society as an information and knowledge society should not lead us to think that the real engine of innovation is technology. Techniques and technologies do not determine society but embody it and society, for its part, does not determine technologies but uses them. In the same way, new technologies do not determine education but must be used to design the development of education and training.

All this imposes a high level of complexity in the relationships between ICT, the Internet and pedagogical practice. ICT is no longer just a tool to amplify and modify traditional human capacities and functions (e.g. memory, perception and reasoning) but allows knowledge and information to be applied to devices to generate knowledge itself and to process and exchange information and knowledge. The human mind is, thus, a real productive force and not only an element of the production process. All this requires, therefore, that there is a careful reflection on the educational dimensions that shift the focus from the use of ICT to the individual, to the personalization of the training project, to the individualization of learning processes through the didactic functions given by the characteristics of interactivity, hypertextuality and multimedia typical of these tools.

Integrating the use of ICT and networks into education and training systems requires a rethinking of "tomorrow's education". First, this integration requires adopting an idea of open and flexible learning. ICT opens up many possibilities in this regard. This is because it is true that educational and training environments must design and implement training and didactic paths aimed at achieving monitorable and verifiable objectives that respond to disciplinary purposes and to specific knowledge and skills related to them. It is also true, however, that educational and training environments, which make use of ICT and the virtual environments offered by the Internet, also allow the development of other forms of knowledge. The materials, experiences, information, and communities on the net, in fact, allow not only the deepening of disciplinary knowledge already acquired, but to experiment with other forms, open and flexible, of learning related to the subjectivity and creativity of each one and respect for the diversity of people and contexts of life.



Furthermore, it should not be forgotten that educational environments can, through the use of ICT, also experiment with paths and processes of culture production, as well as mere transmission of the same. Education and instruction must, therefore, activate strategies, methods and techniques that help learners to organize, develop and reflect on their own learning. It is therefore necessary to relate the information possibilities (disciplinary and non-disciplinary knowledge and knowledge), the possibilities of knowledge (exploration and contextualization of knowledge), the communicative and relational possibilities of ICT and the learning processes in new "integrated" training environments.

A further request addressed to education is to give greater attention, in addition to disciplinary knowledge, also to a teaching more centered on the social construction of useful skills "in life", also through communities of practices, real or virtual, in the networked society. The connection of didactic and cultural resources of real contexts (for example the classroom) and own resources of the network must be continuously negotiated through pedagogical and didactic perspectives that make use of the potential of sharing. The innovations possible with new technologies can lead to great changes in the education and training system if trainers and teachers will not only acquire the technical skills to use computers and the Internet, but also develop skills in the design of integrated learning environments, in the methodological-didactic management of simulated educational experiences, in the production of multimedia and interactive material in a particular disciplinary field.

In training projects in which information and communication technologies play a central role, it is necessary to be able to manage and control the processes of knowledge production, communication exchange and content acquisition. As far as the production of knowledge is concerned, it must be borne in mind that new technologies allow a representation of reality and experience not only at the level of written text but also through an iconic and audiovisual language. Added to this is the world of simulations that shows environments that allow experiences of perception and representation (spatial and temporal) that assert themselves as real and can lead to the production of a "different" culture in a different way. As far as exchanges are concerned, we must consider the whole problem related to the transmission of culture and the mediatization allowed by technologies that have always been considered as tools for communicating with the world. New technologies, on the other hand, also allow us to experience the social dimension of education as they also present themselves as real



environments in which to communicate, where the media become perceptual-cognitive extensions of man. The network, moreover, for its democratic structure of connected nodes without respecting hierarchies between centers and peripheries, allows an immediate globalization of knowledge and emotions. Finally, as regards the acquisition of knowledge, new technologies allow, in addition to the process of abstraction and interpretation of the contents of operations on written texts, also a perceptive, multisensory and multilingual learning process through hypertexts and hypermedia in the network. These potentialities and characteristics make information and communication technologies no longer just tools to communicate with or in the world but real tools through which to activate the main cognitive, emotional and perceptual functions of man. Pedagogical, cultural and political attention must be directed to the network and new technologies as an artifact of interpersonal and social relationships and as a means through which a strong economic, political, social interdependence is established that makes individuals participate in a global community in a virtual world. Training and education must therefore play an important role both to promote access to networks through all training organizations (institutional and non-institutional) and possible economic and structural support, and to produce and disseminate knowledge and knowledge online through the creation of content in digital format.

21

The network becomes a real place of exchanges between nodes and non-hierarchical and non-linear connections, where the educational value is no longer given only in the contents of knowledge, but precisely in the communicative exchange and in the construction of plural identities. The individual, or even the group, the community, in the network can build and strengthen, that is, their identity by opening up to multiple and different experiences. In this sense, the pedagogical perspective is that of "networking", contextualizing and socializing disciplinary knowledge and practices and training actions. The knowledge available, therefore, is no longer only the individual one and already internalized through personal experiences, but also that made available in a network of communication-social cooperation and that which can be experienced through experimental actions aimed at building new knowledge.

It is good that the pedagogical project of creating "networks of skills" and "virtual" communities of study, work, play, etc. capable of building contextualized and shared knowledge must be pursued



only to the extent that they reflect the meaning, characteristics and purposes of "real" communities. Much attention, however, must be paid to the transfer in the networks of reflection on the complex "group" dynamics as it is necessary to do so with the intention of discovering what "changes" in the virtual or what problems are encountered, which critical issues are amplified or reduced, what characteristics have the sense of belonging of the members and the feedback produced, etc. Only in this direction will it be possible to undertake and encourage conscious paths of creation and maintenance of working groups even in virtual environments in the direction of an increasingly widespread construction of knowledge.



IV. CRITICALITY AND DEVELOPMENT PROSPECTS

In considering aspects related to the role of education in the knowledge society characterized by the integrated use of information and communication technologies, unfortunately, the issues related to access and use of these technologies at global and individual level are often overlooked. Talking about access to new technologies refers, then, to the broad debate on what follows, at global or local level, to the different distribution of these "resources".

In this regard, we speak of digital divide (digital divide) to indicate precisely every form of inequality, barrier, limitation existing in access to new information and communication technologies, even if the reasons may be different. Most analyses of the phenomenon have investigated the more specifically social and economic aspects of the consequences on the use of new technologies in the contexts of developing countries. Today, however, we try to give a problematic and interdisciplinary reading carried out according to different interpretative matrices. The origins of the expression "*digital divide*" are traced back to the 90s, when it is used to indicate the disadvantaged position of the various categories of Americans not connected to the network and we begin to discuss the many difficulties that prevent the excluded from accessing the benefits that can derive from the use of new technologies and the Internet. Soon the phenomenon became the subject of study and debate on a global scale, which focused attention on the digital divide between industrialized and developing countries. It is definitely recognised that ICT is one of the most powerful factors in the twenty-first century. Their impact affects people's lives, learning, work and the ways in which governments interact with civil society. The debates are on opposing sides: on the one hand, those who look only at the positive aspects of the information age, which will allow all individuals to access information and knowledge according to a principle of democracy and equality at global level; On the other hand, those who are decidedly more skeptical as they reiterate that bridging the digital divide does not mean bridging the other gaps, the differences in development and well-being of the different societies of the planet and underline the danger in the direction of colonization. Intervention projects that aim to counter the *digital divide* towards a "democratization" of access to technologies seem to correspond to these trends. Most of these interventions are mainly aimed at the search for the



removal of barriers to access to technological tools, to reduce the evident and growing gap between "connected" and excluded. An example in this direction is given by the attempt to overcome the difficulties due to the lack of the necessary infrastructure (for example electricity and cabling systems) to spread information technologies even in countries with strong backwardness. However, there are also projects that contemplate intervention models that intend to bet on new and possible ways of using the technologies themselves, with specific reference to telematic ones. To this end, it is important to support cultural and literacy processes aimed at guaranteeing the ability to use technologies as learning is a fundamental process in the face of equipment that becomes useless without the possession of the necessary skills to be able to exploit them adequately. More recent reflections have highlighted the fact that, in order to interpret and address the phenomenon of the *digital divide*, we cannot ignore both the complexity and multiculturalism of current social contexts and the unstoppable spread of communication technologies in an increasing number of ever-changing economic, cultural, political and social areas. Telematic networks change the contexts of life of individuals and this requires continuous adaptation, also causing a sort of bewilderment towards new forms of communication and exchange of knowledge.

24

A major contradiction is revealed in analysing the problems related to the phenomenon of the spread of ICT. On the one hand, networks and new technologies, precisely because they connect and relate areas and groups all over the world, offer the possibility of connecting people, communities, groups, nations, information and goods, with a democratic and egalitarian vocation. On the other hand, however, access to technologies becomes another element that is added to the barriers that divide the "have" and the "*have not*". Globalization and diffusion of ICT are therefore two phenomena to be analyzed for the understanding of the complexity that characterizes the *digital divide* and that both show contradictory elements within them. Globalisation presents itself as a kind of wild market in which, in the name of competitiveness, human resources and the environment are increasingly exploited in favour of the concentration of power in the hands of a few. The related risks are diverse such as the tendency towards cultural homologation, the monopoly of information and communication systems, cultural uprooting and loss of identity, the emergence of a real virtual world that somehow replaces the "places" of the real world, insecurity in the world of work, the reduction



of spaces of democracy, pluralism, creativity. On the other hand, globalization also has some positive aspects that could be worked on in order to draw less harmful consequences for individuals and communities. It is important to relate and encourage exchanges (of goods and information) on a planetary level and thus to allow cultures to meet.

The development and spread of ICT have led to talk of a real technological revolution, which has also established itself on a global level. This "revolution" allows access to infinite resources and information on the Internet, as well as a reduction in communications costs (through networks, mobile or satellite telephony, etc.). which leads to a completely new cultural transformation compared to those that have occurred in the past. For this reason it is necessary to analyze also from a pedagogical point of view whether this transformation goes towards a new democratic (electronic) citizenship or rather towards a new form of colonization and homologation. It is necessary to find out whether, and to what extent, individuals who use telematics tools have the power and ability to control and use such tools according to their identity and their needs and purposes. In increasingly globalized contexts, it is necessary, therefore, to try to highlight the potential of ICT and activate educational processes that favor the understanding of the complexity of society and help the individual to rediscover and rebuild his individual and collective identity to actively participate in social life. The goal is to put the subject in a position to become / become really protagonist and responsible for his own life, his choices, his present and future. This is the typical perspective of *empowerment*, a psychological and pedagogical approach that is based precisely on the recovery of the skills and abilities of the subjects to achieve these objectives and to react to situations of exclusion and social oppression.

It is now established that the Internet and the spread of information and communication technologies are constantly expanding and are leading to radical changes in the media, in the economy, in people's lives. One wonders, however, for which people and in which parts of the world these changes take place. While a fifth of the world's population travels to cyberspace, the rest of humanity lives in the scarcity of material goods and their world can only be far from optical fibers, telematic networks, mobile phones, computers, etc. A new phenomenon afflicts the southern hemisphere, along with other miseries such as hunger and epidemics. The inability of developing



countries to access new information technologies is in fact now an internationally recognized "poverty", for which new expressions have also been coined. "*Digital Divide*", but also "*Infopoverty*", indicate the technological gap between the North and South of the world, between the nations that can benefit from the progress of telecommunications for the development of their economy and their culture and those that are excluded. It is increasingly asserted that the world risks splitting in two with on the one hand, the new elite, the highly technological class, on the other the proletariat, a-technological or sub-technological. It is therefore believed that the Internet, rather than favouring and creating a more open and equitable society, would favour the accentuation of inequalities. In this regard, there is talk of a new form of apartheid that is found, however, not only between the North and South of the world, but also within the industrialized and hyper-technological countries themselves. There is a growing opinion that new technologies do not help, but rather disadvantage, people who do not have access to them and therefore widen the inequalities that already exist in societies. To the gap between the haves and the have-nots is added, to an increasing extent, that between the connected and the unconnected, between those who can access opportunities and progress to achieve greater personal satisfaction and those who are excluded from this possibility. The answer to this problem, worldwide, sees united proposals for interventions aimed at providing tools and infrastructures so that new technologies and networks reach all corners of the earth. The risk of this prospect is that a sort of e-colonialism will be realized, aimed more at favoring the trade and production of the big names in the IT industry. The new technologies have been, in fact, used wrongly, to increase the profit of powerful companies and multinationals, not the public one. The solution, then, is not to bring computers to less industrialized countries, but rather to create the basis for ensuring that new technologies can be absorbed and consciously integrated, avoiding inducing needs but identifying the actual needs of the population. Importing advanced technologies does not create *empowerment*, but new forms of dependence, sometimes favoring further profits for richer countries. Rather than proceeding with the forced introduction of new technologies in a way that is not adapted to the actual needs of the local population, it is necessary to try to exploit the potential that these technologies offer to bring real benefits to people and populations who are marginalized by the political and economic system. It is important to bear in mind that although the *digital divide*



is a concept that has been used to indicate disparities in infrastructure, investment and access to ICT and the internet, this gap is linked to other disparities. The gap between those who access and those who cannot do so in virtual realities, in fact, not only separates North and South of the world, but crosses the generations and social strata of the populations. The *digital divide* is, therefore, a very complex phenomenon that does not exist only between nations and areas of the world but also, within the same Western and technologically developed world, between people who have and do not have tools to access technologies or knowledge to use them critically (in this case it is knowledge *divide*, knowledge gap).

Information and communication technologies, for their part, can be the essential tool for economic development and material well-being of our era, but only if they can interact with the human values of solidarity, democracy, respect for others and the environment and thus lead to a new system of organizations and institutions capable of generating a continuous and positive cycle between productivity, flexibility, participation in a new model of sustainable development for society and the environment. Knowledge on the one hand and new technologies on the other must form the new basis for the education system and for a modernization of production and development systems, and the Internet in this process asserts itself as the backbone and characterizing element of the new economic structure and the new social organization.



V. MAIN FORMAL AND INFORMAL INFORMATION CHANNELS

In Europe

The European Union is promoting the development of a high-performance European digital education ecosystem and is seeking to improve citizens' competences and skills for the digital transition.

Digital skills and competences are essential to give every individual equal opportunity to thrive in life, find employment and be an engaged citizen. Having digital skills and capabilities and ensuring the availability of digital infrastructure and equipment has become all the more important since the outbreak of the COVID-19 pandemic. Virtually all future learning and jobs will require some level of digital skills and abilities. Constant technological change requires the permanent development of competences and skills by all students in order for Europe to remain economically competitive and participate in social life. However, according to data from the Digital Economy and Society Index, on average two out of five Europeans aged 16-74 do not yet have these skills. Ensuring equality during the digital transition of education and society is crucial. Despite the highest scores in computer and computer literacy, according to Eurostat data, women accounted for only 18% of information and communication technology (ICT) students in 2018.

28

The European Commission is addressing these issues through its flagship policy initiative in this area: the Digital Education Action Plan (2021-2027) which we will shortly address, together with specific actions that play a key role, namely:

- The SELFIE tool as a reflection on effective learning by promoting the use of innovative educational technologies;
- The SELFIE for TEACHERS tool to support teachers' digital competence and improve learning in the digital age;



- Working with the European Investment Bank (EIB), for example through the InvestEU programme, to enable Member States to access finance for digital and physical infrastructures and to support the development of innovative skills and pedagogies;
- The Erasmus+ and European Solidarity Corps 2021-2027 programmes have been made greener and more digital;
- The Recovery and Resilience Facility supports Member States in addressing their digital education needs following the COVID-19 pandemic;
- The European Social Fund promotes the development of digital skills as a vehicle to ensure better and fairer job opportunities for European citizens;
- The new Digital Europe (DIGITAL) programme focuses specifically on enhancing advanced digital skills.

A working group on the European Education Area strategic framework "Digital Education: Learning, Training and Assessment (DELTA) was also established to encourage mutual learning and the exchange of information and best practices between Member States.

29

The Digital Education Action Plan (2021-2027) is a renewed European Union policy initiative to support the sustainable and effective adaptation of EU Member States' education and training systems to the digital age.

The Digital Education Action Plan:

- Offers a strategic long-term vision for high-quality, inclusive and accessible digital education in Europe;
- Addresses the challenges and opportunities highlighted by the pandemic da C ovid-19, which has led to unprecedented use of technology for education and training;



- Aims to strengthen cooperation at EU level on digital education and stresses the importance of working together in all areas to integrate education into the digital age;
- Presents opportunities, including better quality and more teaching related to digital technologies, support for the digitalisation of teaching methods and pedagogies, and provision of the necessary infrastructure for inclusive and resilient distance learning.

To achieve these objectives, the Action Plan sets out two priority areas:

1. Promote the development of a highly efficient ecosystem of digital education.

This sector includes the following aspects:

- Infrastructure, connectivity and digital equipment;
- Effective digital capacity planning and development, including up-to-date organisational skills;
- Teachers and staff involved in education and training who are familiar with and competent in digital technologies;
- High-quality learning content, easy-to-use tools and secure platforms that comply with e-privacy rules and ethical standards;

2. Improving digital skills and competences for digital transformation.

This requires:

- Basic digital skills and competences from childhood;
- Digital literacy, including the fight against disinformation;
- Teaching computer science;
- Good knowledge and understanding of data-intensive technologies, such as artificial intelligence (AI);
- Advanced digital skills, to have a greater number of digital specialists;
- Ensure that girls and young women are equally represented in digital studies and careers.



Digital transformation has transformed society and the economy, with ever deeper repercussions on everyday life. However, until the COVID-19 pandemic, its impact on education and training remained much more limited. The pandemic has shown that it is essential to have an education and training system fit for the digital age, highlighting the need for higher levels of digital capacity in education and training, but it has also amplified a number of challenges and inequalities between those with access to digital technologies and those without, including those who come from disadvantaged backgrounds. In addition, it highlighted a number of challenges for education and training systems related to the digital capacities of educational institutions, teacher training and general levels of digital skills and competences.

On the other hand, the numbers speak for themselves, in fact according to a study by the Organization for Economic Co-operation and Development (OECD) in 2018 it was found that less than 40% of educators feel ready to use digital technologies in teaching, with wide differences within the European Union; furthermore, more than a third of 13- and 14-year-olds who participated in the International Study on Information and Information Literacy (ICILS) in 2018 did not possess the most basic level of competence in digital skills; finally, according to 2019 Eurostat data, a quarter of low-income households do not have computers and access to broadband, with strong differences within the European Union according to household income.

The pandemic has accelerated the current trend of online and hybrid learning. Thanks to this transformation, teachers and students have discovered new and innovative ways of teaching and studying online and the possibility of interacting in a more personal and flexible way. These changes require a strong and coordinated effort at EU level to help education and training systems address the challenges identified and exacerbated by the pandemic of Covid-19, while proposing a long-term vision for the future of European digital education.



In Italy

The main national and international indicators related to the area of digital economy and society (such as, for example, the DESI of the European Union Commission, the OECD reports on *eGovernment* and *education*), show that Italy is significantly penalized in digital growth by a skills shortage in the population, which negatively influences:

- The possibility of exercising citizenship rights and conscious participation in democratic dialogue;
- The adequacy of skills with respect to the demands of the world of work;
- The country's ability to respond to the needs of new markets and related jobs, largely related to emerging technologies.

The lack of digital skills, as well as on citizens' private lives, also has a clear impact on their employability. The OECD *Skills Outlook Scoreboard* analyses digital skills for the economy of the future and Italy ranks among the last places in the ranking. Among all, the most alarming figure concerns workers at high risk of automation according to which only 20% benefit from continuous training, while as many as 40% of workers engaged in professions with low risk of automation have access to refresher courses.

32

Digital public services must be inclusive and accessible to all, without any kind of discrimination or any form of gap. Possessing the necessary digital skills is essential to be able to fully exercise citizenship rights. In the ongoing digital transformation, no one should be left behind.

For this reason, "Repubblica Digitale" is the national strategic initiative promoted by the Department for Digital Transformation of the Presidency of the Council of Ministers in the framework of the "Italy 2025" strategy with the aim of combating the digital divide of a cultural nature present in the Italian population, to support maximum digital inclusion and promote education on future technologies, accompanying the digital transformation process of the country. To date, there are many projects and initiatives underway for digital facilitation, such as the "ANG inRadio" network of the National



Youth Agency, or a digital radio aimed at listening to young people, social inclusion and strengthening digital skills through activation on social and cultural issues; the national "FIERIDA", a major event dedicated to adult education and linked to "Leonardo visionario", a training project on innovative teaching and digital technologies in education; the "National Activity Plan for Innovation in Adult Education (PAIDEIA)", which supports the activities of the Territorial Networks of Lifelong Learning ; Finally, we remember the regional initiatives such as "Pane e internet" in Emilia-Romagna and "DigiPASS" in Umbria.



VI. STRENGTHENING POSSIBLE REGULATORY AND PRACTICAL SYNERGIES

The widespread, rapid and large-scale development of digital service platforms, as well as debates on public data spaces and new technologies such as artificial intelligence, affect all sectors of our society. Many new ways to communicate, shop or access information online are now part of our daily lives and are constantly evolving. The Digital Agenda for Europe 2020-2030 addresses these issues by focusing on creating secure digital spaces and services, creating a level playing field in digital markets with large platforms, as well as strengthening Europe's digital sovereignty, while contributing to the European objective of climate neutrality by 2050.

Although the Treaties do not contain special provisions for information and communication technologies (ICT), the European Union may take relevant action in the framework of sectoral and horizontal policies, such as: industrial policy (Article 173 of the Treaty on the Integration of the Union E Europe (TFEU)); competition policy (Articles 101 to 109 TFEU); commercial policy (Articles 206 and 207 TFEU); trans-European networks (TENs) (Articles 170-172 TFEU); research and technological development and space (Articles 179 and 190 TFEU); energy policy (Article 194 TFEU); approximation of laws with a view to improving the establishment and functioning of the internal market (Article 114 TFEU); the free movement of goods (Articles 26 and 28 to 37 TFEU); free movement of persons, services and capital (Articles 45 and 66 TFEU); education, vocational training, youth and sport (Articles 165 and 166 TFEU); and culture (Article 167 TFEU).

34

The European E Agency launched in 2010 over a period of 10 years, established for the first time the key role of ICT in achieving Europe's objectives. In 2015, the Digital Single Market Strategy further developed the Digital Agenda, setting out specific provisions based on three pillars to ensure a fair, open and secure digital environment, namely:

1. Improving consumer and business access to digital goods and services across Europe;
2. Creating an enabling environment for digital networks and services to develop;
3. Maximise the growth potential of the digital economy.



In 2020, the second five-year digital strategy, entitled 'Shaping Europe's digital future', focused on three key objectives in the digital sector: technology that works for people, a fair and competitive economy and an open, democratic and sustainable society. In 2021, the strategy was complemented by the "Digital Compass 2030: the European model for the Digital Decade", a ten-year tool that aims to translate the European Union's digital ambitions for 2030 into concrete terms .

The first Digital Agenda for Europe (2010-2020) aimed to improve access to digital goods and services for consumers and businesses across Europe by equipping the European Union with an advanced system on user rights and consumer and business protection.

The Second Digital Agenda for Europe (2020-2030) focuses on the profound changes introduced by digital technologies, the essential role played by digital services and markets, and the European Union's new technological and geopolitical ambitions. In addition, on March 9, 2021, the European Union proposed a "Digital Sleep" which includes four digital objectives to be achieved by 2030:

1. Competences-> at least 80% of adults should have basic digital skills and there should be 20 million ICT specialists in the EU, with an increase in the number of women;
2. Companies-> 75% of businesses should use cloud computing, big data and artificial intelligence services; more than 90% of EU small and medium-sized enterprises should reach at least a basic level of digital intensity; the number of 'unicorn' businesses in Europe is expected to double;
3. The infrastructure-> all European households should be covered by a Gigabit network and all areas inhabited by 5G; state-of-the-art and sustainable semiconductor production in Europe should account for 20% of the value of world production; 10 should be installed in the European Union. 000 climate-neutral and highly secure peripheral nodes and Europe should have its first quantum computer;
4. Public services-> all major public services should be available online; all citizens will have access to their electronic health records and 80% of citizens should use an electronic identity solution.



In Italy, the strategy for Digital Italy 2026, approved in March 2021, has established ambitious objectives for the Paese, in line with those of the European Digital Compass 2023 but with tighter deadlines. The plan, developed thanks to funding from the PNRR, envisages guaranteeing ultra-broadband connectivity throughout the country by 2026, accelerating the digitization and dissemination of digital services and public platforms, accelerating the digitization of public health and harmonizing its diffusion on the territory, increasing the level of cybersecurity in the country and intervening on the digital skills of citizens. At the same time, it is planned to relaunch Italy's leadership in space and start strengthening the country in strategic technologies for the future.



CONCLUSIONS

We have seen that Europe's ambition is to pursue digital policies that give citizens and businesses the autonomy and responsibility they need to achieve a human-centric, sustainable and more prosperous digital future. Europe will need to build on its strengths: an open and competitive single market, rules anchored in European values, a leading role in fair and regulated international trade, a strong industrial base, qualified citizens and a strong civil society. At the same time, it will face strategic weaknesses, vulnerabilities and high-risk dependencies that may hinder the achievement of its goal towards the digital transition.

To sustain competitiveness, people need the latest advanced digital skills to support the dual transition, green and digital, of society, public services and all sectors of the economy. The spread of technology has an impact on workplaces and daily life. This makes it all the more important to invest in lifelong learning by promoting, offering and recognising skills improvement and reskilling for the digital economy. The promotion of inclusive and high-quality digital education must be a joint effort of society as a whole. Governments, education and training institutions, the private sector and the public sector must all be involved in this effort in order to develop a highly efficient ecosystem of digital education. A trusted digital education ecosystem requires high-quality content, easy-to-use tools, value-added services, and secure platforms that protect privacy and respect ethical standards.

Particular attention is paid to the issue of inclusion, whose investment in knowledge, skills and competences aims to benefit individuals, institutions, organisations and society as a whole by contributing to sustainable growth and ensuring equity, prosperity and social inclusion in Europe and beyond. More generally, the European Union aims to rethink the role of the digital divide in a strategic key to redesign a truly inclusive future, which allows all citizens to seize the opportunities of the green and digital transition. Citizens must be included in the transformation process, so that they play an active and responsible role and know the objectives, challenges and new sustainable consumption patterns. Their consent is crucial in order to understand the responsibilities in achieving a sustainable



future. It is necessary to involve the whole community, especially the most disadvantaged groups, with a view to leaving no one behind.



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