Considerations on the Influence of Digital Technology regarding Education in Romania

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Abstract —- **Digital education is one of the basic preoccupations of Romanian education that contributes to the formation of digital information and communication culture at every citizen level. Without an educated population eager to use information and communication technologies, no community can truly participate in the global network. Through the development of technology and the emergence of modern means of information, the perception of education is changing and the major development centers in the field of education are trying to bring education to another level, basically using the young generation's dependence on new technologies by developing online platforms which students and students can easily access, but also accessible to teachers who wish to align their teaching methods with current modern requirements. Considering the above-mentioned aspects, the main objective of this paper was to investigate the specialized literature of this field and to make a critical synthesis of the current state of influence on digital technology regarding the activity of Romanian education in the context contextually imposed by the requirements of integration in the globalized world.**

Keywords — digital technologies, education, ICT, digital skills, digital textbooks.

I. INTRODUCTION

The unprecedented evolution of technology and the insertion of its resources in all sectors of society, including education, are the starting point for doing this. The need for such an analysis is highlighted, on the one hand, by technological transformations and, on the other hand, by the high importance of digital technology resources in the lives of those who use them. Being an essential and compelling component of their existence, transforming learning, socializing and playing notions the use of technology is not only an option, but also binding on the development and formation of future adults for all learning environments. Extending didactic activities developed with the help of new tools outside the formal context of the school has become the factor that differentiates between young people who are trained to integrate into the digitized society that requires more and more competent people for the digital environment and those who have only been trained elementary in schools [1]. Modern technologies are always an attraction for young people, including in the educational system, and the use of modern methods has meant a paradigm shift for both students and teachers who have found that traditional education is very effective with digital technology [2]. Digital transformation depends to a large extent on both people and their ability to

understand new concepts in the field of information and communication technology and to use them effectively in their day-to-day work. In the same way, we must also talk about highly qualified, digital skills of those specialists who represent the human resources needed to develop and implement modern IT solutions [3].

The Ministry of National Education is taking concrete steps towards digital literacy and digital literacy in preschool, primary and secondary education, restructuring framework plans and curricula so that all the pre-university formal education is adapted in this direction [4]. The action was accomplished not only by ensuring a specialized discipline in the program, but also by introducing the use of new technologies in the educational activities of all disciplines. As far as higher education is concerned, it is unambiguously that we need a focus on IT specializations, such as those related to the concept of "smart city" or online marketing, and in this respect dialogue with all academia and university actors to be able to materialize appropriate and attractive university programs [6].

Specialist literature, through the multitude of papers developed in this area, analyzes the recent use of digital technologies among educational systems and developing countries, such as Tanzania [6], where infrastructure and resource issues in the region lead to the existence of significant learning disparities in digital technology in education, focusing on problem areas and promising approaches that need to be tailored to take advantage of digital technology in education.

Other authors [7], appreciates that the adoption of information and communication technologies in early education is essential for adapting traditional classrooms to the digital age. Although early children are increasingly using these technologies, there is a significant gap in the knowledge of using this technology in early childhood education. At the same time, they also demonstrated that by using modern technologies at this age they are more motivated and have achieved better results than those who have used the paper books.

Some professionals of this area [8], studies in their paper the existing evidence of what a digital university is and what actions to take to become such a university they have investigated on a small scale within the Romanian educational space who have highlighted the steps to be taken, the actions,

responsibilities and concrete measures that should be taken to promote such a vision.

Digitization in German higher education institutions is being studied as a problem affecting many educational stakeholders [9]. ICT skills are becoming more and more relevant in all contexts, with different policies, initiatives and strategies being proposed to address higher education technology innovations in higher education. In this respect, a University examines the perception of students and teachers about the use of digital instruments, suggesting strategies to support the wider use of educational technology for didactic and learning purposes.

Research Methods for Education in the Digital Age are reviewed by another author [10], through reviewing top domain authors, understanding the terms of digital technology and the many available research options that digital technology can offer, bringing a personal view on the use of some or other of these methods.

II. RESEARCH METHODOLOGY

The present study is a qualitative research carried out as a result of the analysis of the theoretical approaches regarding the influence of digital technology on the activity of Romanian education. The motivation that led to the choice of such research is primarily due to the adhesion elements that can only be presented through this method. At the same time, the comparison method has been used, which highlights the vision of digital technology in the European space with that of the Romanian space. For the purpose of this article we used information sources, articles published in specialized journals, books, scientific studies published in the proceedings of the conferences, various web sites specific to this field. By using induction and deduction we have carried out an exhaustive analysis of the extent to which digital technologies influence education in Romania. Taking into account the content of the paper and the contribution made, we have developed a documentary work and the actions taken to accomplish the article were: planning, collecting information, analysing and drawing up this scientific approach.

III. RESULTS AND DISCUSSIONS

A. *Challenges and opportunities for the digital transformation of education*

Changes that have taken place at European level have also made their mark on digital transformation that affects communities through the way they live, interact and study, and it is particularly beneficial to invest in digital competences throughout their lives. It has various benefits that contribute to supporting economic growth and inclusion in the EU, bringing multiple challenges to the current globalized world [11].

All efforts directed towards this direction have been initiated to reduce the existing gaps in EU Member States regarding digital infrastructure and skills, with the youngsters' lack of interest in studies in the field of information and communication technologies (ICT) and in the fields of science, technology, engineering and mathematics (STIM). All the opportunities offered by such a transformation, through the use of digital technologies and their use, will lead to a diminishing learning gap for pupils from favored socio-economic and disadvantaged backgrounds.

Currently, mobile internet access for educational purposes has greatly increased, but there are primary and secondary schools that do not have adequate access, and teachers do not have the skills to use digital teaching tools. By adopting new services, technologies and skills by educational entities, learning outcomes can be improved to maximize efficiency and sustainability through the proper use of digital media. All progress in the digital field brings new elements for pupils, students and teachers, at a stage where the need for media literacy, varied digital, security and privacy literacy skills becomes necessary [12].

Through cooperation at European level, all digital opportunities are actively used to improve the teaching and learning process, with various studies and surveys related to the use of technology in various schools. In order to achieve these goals, an Action Plan for Digital Education in 2017 was proposed to capitalize on the opportunities offered by globalization as the mobile and digital society with the most effective non-technical and digital skills, and in line with the fact that "all forms of education and lifelong learning may need to be adjusted to take advantage of new digital technologies." Through this document, a number of objectives have been drawn, among which:

- Support for high-quality education;
- Improving its relevance;
- Developing the digital competences of European citizens and increasing their visibility;
- Stimulating innovation and digital competences in all educational institutions;
- Opening up education systems.

The implementation of this action plan aimed at establishing digital practices in the field of education, with the following **priorities:**

- *Effective use in the teaching and learning of digital technologies.*

In today's economy and society, digital technology has increasingly felt its presence. Everyday life is based on digital technology in various forms, but education used has a great potential to improve it. An important role for digital education is to ensure equity, quality of access and infrastructure for all beneficiaries of the education system. Innovation in education and training is dependent on the capacities and connection of teachers, being achieved through the Erasmus+ program, which is an opportunity to support learning and online exchanges in different countries.

Digital training in education requires a lot of knowledge in the field, with innovation areas in digital education across Europe, but whose policies and practices need support for widespread applicability. Such an approach for the implementation of digital teaching and learning technologies was initiated through the self-assessment tool SELFIE, which was launched in the pilot phase in schools in 14 European countries [13].

Mobility is an important component of education, and digital technologies play a key role in further improving it. In this respect, Erasmus+ projects will be eased, the European Student Erasmus and Erasmus Card will be introduced, so that

they can contribute to European interconnection. For such an approach, it is necessary:

- Enabling students to identify themselves in a safe manner, in accordance with the principle of single registration;

- Digital connection to computer systems of higher education institutions;

- Allowing secure exchange and verifying student data and academic results;

- Reducing administrative procedures;

- Allowing access to the services that students are entitled to arrive in the host country.

The European Students' Initiative launched by the European community aims to improve the quality of student mobility in Europe so that all participants in the Erasmus+ mobility program by the year 2025 can be automatically recognized in all Member States as well as their right to access campus services when arriving abroad, such as teaching materials, enrollment services, libraries, and the number of beneficiaries, pupils, students and teachers expected to be either very high.

- *The relevance of digital transformation through the development of digital competences and skills.*

For the functioning and development of the digital society, all citizens need skills that enable them to access the challenges of digital transformation, and also take advantage of the opportunities it offers, such as the ability to read, write and calculate, necessary be understood and applied at various levels of digital competence.

This digital competence at European level is achieved through lifelong learning that all citizens should have. It involves the use of digital technologies that include the knowledge, skills and attitudes of all citizens in an evolving digital society. Thus, at European level, digital competence covers the following areas: information and data education, communication and collaboration, digital content creation, safety and well-being, and problem solving [14].

The acquisition of digital skills must start from a young age and continue throughout life, an objective that can be achieved in curricula or extra-curricular courses. Relevant in this regard, it was the initiative to encourage all schools in Europe to participate in the EU Week of programming through collaboration with all authorities in the EU Member States.

Emphasis should also be placed on addressing effectively the challenges posed by digital transformation in online safety and cyber-hygiene by reinforcing critical thinking and media literacy of children and young people in such a way that they can discern and overcome threats related to false news, internet bullying, radicalization, cyber-security risks and fraud, include cyber security in academic and professional training programs.

Eliminating gender inequalities through digital and entrepreneurial education is vital for Europe who wants to capitalize on the benefits of the digital revolution. Although girls and boys have similar levels of interest and expertise in digital technologies, their number is lower than boys. Increasing the number of women in such a career will help

unlock Europe's digital potential and ensure that women contribute to the definition of the digital world as much as that of men. At EU level, according to Eurostat - 2015 statistics, women accounted for 16.1% and 83.9% of employed ICT specialists were men.

- *Improving education with better data analysis and prospective vision.*

The use of technology creates data that can be exploited to develop in-depth and forward-looking understanding of the development of education systems or to identify solutions to the current challenges of education through more effective coordination at EU and international level (OECD). At the same time, the data also helps identify and address the need for evidence-based policy measures to help improve education through personalized learning through several pilot research projects in the field. Data and trends in education are generally collected and recorded "top-down" under the guidance of international organizations and governments. Institutions in the education and training system are trying to keep up with the technological novelties that will force the actors in this field to decide on the changes that may occur at a certain moment. Teachers encourage students to use digital tools for research and writing, thus revealing new ways of using information and communications technologies for academic purposes and not just socializing.

B. Approaches to Information and Communication Technology (ICT) in Romanian education

Over the past two decades, information and communication technology (ICT) has been transformed into a product for a limited number of individuals, due to high acquisition costs and relatively large dimensions, in an ever-increasing tool in people's professional and personal lives. The benefits of ICT are not negligible at all, which has attracted the rapid spread of educational activities, whether formal or non-formal. Education has used the opportunity offered by ICT to rethink how to provide educational content in a way that improves student performance without costing the system.

The school is a welcoming, warm and open space for all children where they spend their time, doing lessons or other activities to relax, read, socialize with each other, or through online social networking. The continuous development of education offers everyone the chance to have modern schools where creative teachers, fascinated students of knowledge, attractive classes, morning school classes, school themes, clubs for non-formal activities, and evening-time - only for relaxation spent with family and close friends.

However, our education system has evolved slowly but surely, enrolling in an upward trend, based on multiple innovations in education [15]. The new digital age is shaping a new type of educational phenomenon through new communication and information technologies. The analysis of online virtual education leads us to the conclusion that there is a new perspective of approaching the education process in the conditions of postmodern societies.

Global technology-dominated culture produces mass media literacy and outlines a new learning model. Virtual online education provides useful skills for young people in the process of tuition. Developed application tools transform the

learning process into an accessible and interactive learning environment, depending on the requirements of accepted models in society. The high degree of applicability, as well as the impact force generated by these technologies, must lead to their widespread introduction at the level of general education [16]. The advantage of new technologies is the high receptivity of young media consumers. The digitization of the classes in the compulsory education in Romania is subject to projects based on structural funds. The world of the future is where digital skills are part of compulsory education in Romania and anywhere in the world.

The Computerized Educational System (SEI) is a complex program initiated by the Ministry of Education and Research in 2001 and is currently operational and its main objective is to support the teaching-learning process in pre-university education with state-of-the-art technologies. Based on the results obtained, the SEI Project is considered at European level one of the most advanced projects for the use of information technology in education and is one of the most successful computer education campaigns in the world.

The use of virtual platforms for the realization of educational projects is a new concept approached in the educational environment. Learning is not focused on learning objects but on the skills and abilities that the learner needs to develop, stimulate teamwork, favoring the group's attachment to the values promoted by the project [17]. One of the most widely used virtual platforms is Thinkquest, developed and supported by the Oracle Foundation for Education, sharing ideas, inspiring creativity and communicating information, enhancing communication skills in various languages, operating with various software, teamwork and partnership, offers each member of this virtual community a protected user account and a personal web page. Another virtual platform is provided by eTwinning, which is part of the European Commission's Lifelong Learning Program, which promotes collaboration between European schools through information and communication technology. On the iTeach platform, a free online course for teachers is available: Collaboration in the digital class that provides teachers with innovative methods for collaborative activities using various tools. Upon completion, teachers will be able to plan and conduct educational situations using the tools and digital applications studied.

Deeper digital literacy is required for many professions, not just people working in the ICT field to effectively support the next generation of analysts, researchers and innovators in areas such as medicine, management or social care.

C. *The need to use digital textbooks in education*

Educational computerization at primary level has led to many controversies at European level, with both positive and negative views in this respect, although all Member States have been experiencing this pattern for some time [18]. For example, Poland has opted for a special strategy, even though things are not clear here, and the infrastructure needed to implement digitization in the Polish school suffers quite as much as in the case of Romania. In the case of this country, textbooks are produced by the government, not the publishers, only digitally, and for all levels of study, being produced by university teachers, of various specialties. Thus, the Polish Government is the only producer of school textbooks, the

situation was similar in our country before 1989, when the Romanian Communist state, through the Ministry of ȘtEducation and the Didactic and Pedagogical Publishing House, was the only author of school textbooks in the country.

Such a situation exists not only in Poland but also in Hungary, where the textbook market has been nationalized. In Norway, free digital textbooks for all classes and all levels have also been introduced, and teachers have the option of choosing their manuals from publishers or the internet. In many EU countries the mixed system was implemented. In some schools there are textbooks, some in the digital system, others on paper, and on digital media. The tendency of the state to seize the market and produce digital textbooks and eliminate competition among publishers is apparently present in several European countries.

Beyond the editorial outlook of the school textbook revolution at the European level, there remain questions that await an answer such as: fears among teachers and parents about the introduction of digitization in education, and there are numerous studies on negative or positive impact of the implementation of digital technology in education at very young age. Modern children tend to develop other skills through interactions with technology, even at very younger ages. Romania has a great inability to access these digital textbooks by a significant percentage of the population, which will lead to a polarization of Romanian society, some children will not be able to access certain abilities in a society that will use them more and more for which they can't be trained, as well as the creation of a gap in the communication between parents and children.

The production of digital textbooks is not harmful, the eLearning phenomenon exists all over the world, and the fact that it has reached the public system in Romania is further evidence that it is beneficial to the current society. The Digital Handbook is consequently the effect of unprecedented computerization of society, the explosion of information of recent years has in the beginning led, as a pure experiment, to the introduction of this support in the education system. This educational system has become more and more present in university and pre-university environments. The fundamental component of e-learning systems is the specialized teaching-evaluation applications [19, 20, 21]. Online learning is suitable for a diverse range of activities. I consider that e-learning offers a number of necessary advantages in the educational practice, namely:

- This type of education develops learning and self-disciplinary organizing skills;

- Enables distance learning, interactive learning;

- Learning focused on specific tasks, according to the pupil or student's interest in training, allows a high degree of adaptability to the requirements of contemporary education systems;

- Generates and enables the development of specific online assessments;

- Develops the practice of individualized learning, in line with contemporary educational requirements.

IV. CONCLUSIONS

Romania needs to go through digital transformation and improve its citizens' digital literacy mechanisms in order to reduce the gap between young Romanians and the rest of the European Union. Any initiative, public or private, that enhances the digital abilities of Romanian citizens is welcome and should be encouraged as it contributes to the general development of the Romanian society and economy. The Romanian education system encourages and supports, only sporadically through European projects, the use of technological resources at all levels of education. National projects are doomed to political incoherence blockages or to the need for continuity by decision-makers. The example of digital textbooks for primary classes is the most common example of the abandonment of research platforms for higher education.

Our education system has evolved slowly but surely, enrolling on an upward trend, based on multiple innovations in education. The new digital era will determine a new type of educational phenomenon through new communication and information technologies. The analysis of online virtual education leads us to the conclusion that there is a new perspective of approaching the education process in the conditions of postmodern societies. Virtual Education is a step forward in this highly informative era, providing useful skills for young people in the process of learning. The developed tools of application programs, marked by specialized design, concern an accessible and global standard of presentation of specialized knowledge. In this regard, virtual learning platforms can provide both the opportunity to organize current curricular activities as well as the development and implementation of educational, curricular or extracurricular or non-formal projects, thus ensuring the achievement of the objectives of integrating digital education into learning. Interactive learning through multiple specialized eLearning formulas is a necessary variable in the context of contemporary educational valorisation. In this respect, we can talk about a process of adapting to the e-literacy system of younger generations.

I believe that digital competences are essential in the education of young people because they help them take full advantage of the digital world - both as employees and as future entrepreneurs. A young and well-educated workforce is a great opportunity for Romania to take full advantage of the benefits of the digital revolution and to advance economically. That is why encouraging digital literacy must be one of the most important objectives of the 2017-2020 governance program, and digital skills should be the backbone of a modern education system.

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