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SDG4: Digitising Education, Training, and Skills in the Context of the 2030 Agenda for Sustainable Development

Marcela TANASCIUC[1]

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Abstract

In the context of sustainable development and the SDGs of the 2030 Agenda, quality education remains a priority. Undoubtedly, in the age of technology, digital competences and skills are essential to offer everyone equal opportunities to learn and develop, to build sustainable careers linked to the jobs of the future, and to become active citizens. In this regard, digitising education and ensuring the availability of digital infrastructure and equipment became even more relevant after the outbreak of the COVID-19 pandemic, which changed the international order. However, on average, two out of five Europeans aged between 16 and 74 still lack these skills (Digital Economy and Society Index). Moreover, school drop-out is still a reality, with an EU average of 10%. Therefore, this paper aims to analyse SDG4 on quality education, namely the digitisation of education and lifelong learning, as a response to the challenges of the future in the context of Agenda 2030. To achieve this objective, conceptual qualitative research through content analysis was conducted based on international writings, publications, and articles from various authors, specialists, and entities in the field. In addition, the research was further explored by means of a case study on Romania. The results show us that, basically, all forms of learning and jobs in the future will require a certain level of digital skills and competences. Moreover, the constant technological changes demand continuous exponential training and efficient practices for Romania / EU to remain economically competitive, politically stable, and prosperous. In this respect, reducing social disparities, ensuring access to quality education, and securing equality during society's digital transition are of crucial importance.

Keywords: EU, education, digitisation, sustainable development, skills.

JEL Classification: I20, Q01.

[1] Bucharest University of Economic Studies, Bucharest, Romania, tanasciucmarcela@gmail.com.

1. Introduction

Undoubtedly, humanity is going through challenging times in an overwhelming reality, currently facing the second major crisis in the last four years, the war in Ukraine, preceded by the COVID-19 pandemic, which has caused global economic shocks. In this context, mobilising efforts to stabilise the situation, streamlining the activities and processes involved, and concentrating forces to achieve sustainable development goals are part of the actions that set the European Union's future course.

Sustainable development is thus a basic principle, firmly anchored in the European treaties, in particular the *Treaty on European Union*, but also a priority objective for the European Union's internal and external policies. In September 2015, Romania and the other 192 member states of the United Nations adopted the 2030 Agenda for Sustainable Development, which includes 17 Sustainable Development Goals (SDGs), 169 targets and 232 indicators in key areas such as industry, labour, health, education, gender equality, and others, designed to be universally applied in all member countries (both developing and developed) and to outline a European pathway to 2030. The 17 SDGs replace the 8 Millennium Development Goals (MDGs) and promote balance between the 3 dimensions of sustainable development: economic, social and environmental. Moreover, the *United Nations 2030 Agenda* is a commitment to eradicate poverty, to protect the planet by fighting climate change intelligently and sustainably, and to give people the security of tomorrow, prosperity, and peace that are so necessary today.

In this context, *SDG 4 – Quality Education* remains a priority. This goal aims to "ensure quality, inclusive and equitable education and promoting lifelong learning opportunities for all".

2. Research Questions / Aims of the Research

Education has always been an integral part of the sustainable development agenda, seen as an enabler of the transition to sustainability. As a result, there is growing international recognition of Education for Sustainable Development (ESD) worldwide. ESD is closely linked to international discussions on sustainable development, which have grown in scope and importance since the 1987 World Commission on Environment and Development report "Our Common Future", which provided the first widely used definition of sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, Brundtland Report, 1987).

The importance of promoting education for sustainable development and the active integration of sustainable development into education was also highlighted in paragraph 233 of the "Future We Want", the outcome document of the 2012 United Nations Conference on Sustainable Development, Rio+20 (United Nations, 2012). In 2005, UNESCO launched the United Nations Decade of Education for Sustainable Development, which reaffirmed the key role

of education in shaping values that support sustainable development and in building sustainable societies.

Nowadays, 103 million young people worldwide have no access to primary education or are illiterate. Of these, the most significant percentage (60%) are young women or girls, as per the United Nations *2022 Annual Report* (United Nations, 2022). According to recent studies, more than 70 million Europeans have inadequate reading, incomplete writing skills, poor mathematical thinking, and insufficient digital skills, all of which catalyse problems such as poverty, unemployment, or social exclusion (IMD World Competitiveness Center, 2022). There are 12 million unemployed in the EU, half of whom are low-skilled (Union Monitoring report on progress towards the SDGs in an EU context, 2022). Moreover, on average, two out of five Europeans aged between 16 and 74 still lack these skills (Digital Economy and Society Index). The skills gap and mismatches are striking. Many people work in jobs that do not match their talents. At the same time, 40% of European employers have difficulty finding employees with the appropriate skills needed for future jobs (World Bank Group, 2021). Access to education and training remains a key indicator of quality of life, according to a survey of more than 40 countries (OECD, 2020).

The EU economy is constantly evolving. The demand for relevant knowledge, skills, and abilities is changing at lightning speed. To cope with these changes, people need to be equipped with a set of key competencies, including functional literacy and digital skills. UNESCO defines the formal education as an ”institutionalised, intentional and planned education through public organisations e.g. relevant national educational authorities (UNESCO, 2010). Additionally, formal education consists mostly of initial education. In addition to basic/functional education including writing, reading, and numeracy, intelligent programming languages are also needed. Critical thinking, creativity, STEM (Science, Technology, Engineering, Mathematics), SMAC (Social Computing, Mobility, Analytics and Cloud Computing) and cross-disciplinary skills are eminently necessary to become active citizens, to build sustainable jobs and careers, so basic conditions for economic growth. Hence the actuality of this topic of analysis.

Therefore, the present paper aims to analyse SDG4 on quality education, namely the digitisation of education and lifelong learning, as a response to the challenges of the future in the context of Agenda 2030, with Romania as a case study in this respect, including the problems it faces, reported educational disparities and prospects.

3. Research Methods

This research is based on a theoretical methodology, which aims to synthesise the available information on the research questions through the analysis of several articles, technical reports, the results of studies and surveys. The literature comes mainly from international journals, business publications, websites of public institutions at local and international level, and government websites.

Moreover, in order to get closer to the objectives stated in the introduction, I considered the use of the case study method as appropriate. A case study refers to both an analytical technique and a specific research methodology to explore a problem in the social sciences, both of which can be used to generalise findings to the whole population. Case study research intends to investigate an individual, a community, a society, a location, an event, or another type of study topic to extrapolate main themes and findings that help better predict patterns, bring important subjects into focus, and/or provide a clearer understanding of a research topic.

The methods used to investigate a case can be classified as quantitative, qualitative, or mixed. In this paper, qualitative and conceptual research has been carried out with the support of various articles and studies. Among the main advantages of using the case study method are: the possibility of conducting intensive research, improving analytical capacity, and deepening knowledge of a social phenomenon. However, the case study method, like any other method, also has some disadvantages such as: the possibility of errors, the subjective nature, and the lack of fixed limits of the investigation.

Google is considered the principal online search engines for the purposes of this paper. Moreover, the following tools were used to locate (a) grey literature relevant to the research problem and (b) key researchers' work: Google Scholar, Google Academics, Connected papers, Dimensions.

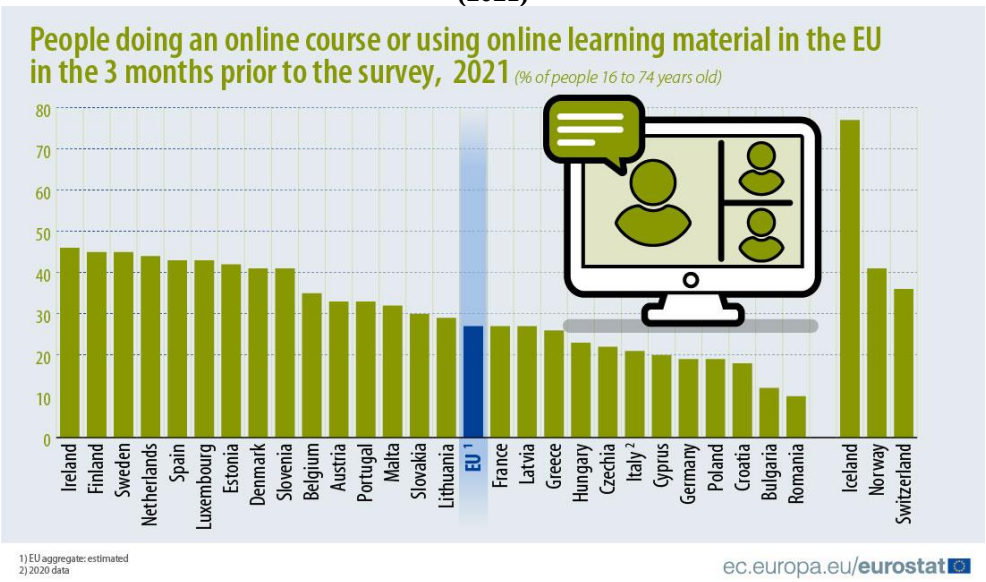
The main limitations of the case study are recall bias, its retrospective nature, and the need for a careful collection of measured variables.

4. Problem Statement

There is no doubt that the COVID-19 pandemic has accelerated digitisation in education. Educational institutions have had to switch to digital channels for teaching. Students, learners, and teachers have started using platforms such as Zoom, Microsoft, Teams, Meet, Google Classroom, Discord, Skype, Webex, and others to meet educational challenges (INACO, 2022).

However, in addition to the need to adapt to distance learning, imposed by the pandemic situation, online schooling is an innovative, convenient, and safe alternative to education and training. According to Eurostat data, in 2021, 27 % of 16-74-year-olds in the EU said they had taken an online course or used online learning materials in the three months prior to the survey, which is an increase of 4 percentage points (pp) from 23 % in 2020 (Eurostat, 2022). In 2021, among the EU Member States, Ireland had the highest share (46 %), followed by Finland and Sweden, both at 45 %, followed by the Netherlands at 44 %, as illustrated in the figure below.

Figure 1. People doing online course or using online learning material in the EU (2021)



Source: Eurostat (2022).

At the other end of the ranking are Croatia (18 %) and Bulgaria (12 %), with Romania at the bottom by 10 pp. Thus, compared to 2019 (before the pandemic), the share of people who practice distance learning and use online materials has increased in all Member States except Romania, where it has decreased by 4 percentage points to 10 %.

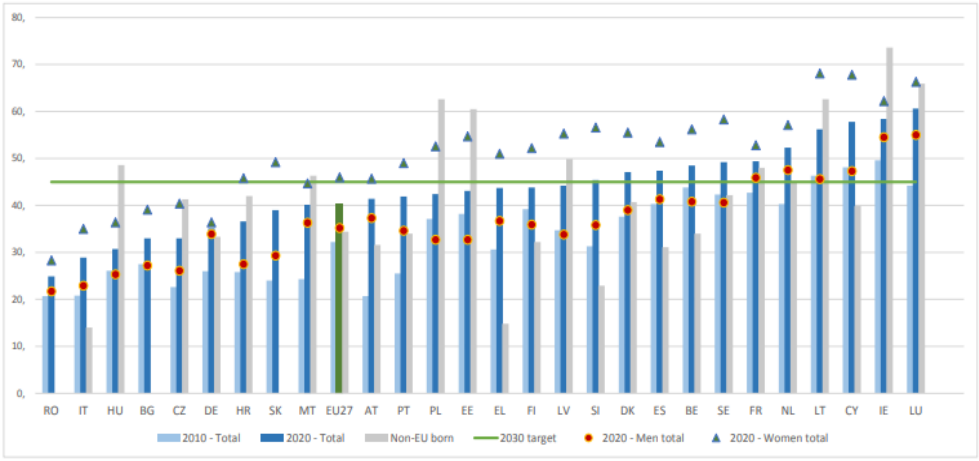
According to the same study, young people aged 16 to 24 have made more use of online learning than the average adult population. In 2021, 39 % of young people said they had taken an online course and 49% used online learning materials, compared to 23 % and 27 % among adults aged 25-34 and 20 % and 23 % among adults aged 35-44. The rates continue on a downward trend as age increases, reaching their lowest point among older people (aged 65-74), where 3 % have taken an online qualification, and 4 % have used materials available on the Internet.

I can therefore ascertain that young people are more likely to develop digital skills, but contrary to the general view that today's young people are a generation of 'digital natives', the results of the International Computer and Information Literacy Study indicate that youth do not develop above-average digital skills just by using digital devices, they need continuous training and effective practice (ICILS, 2020).

On another note, quality tertiary education plays a key role in the labour market prospects and social mobility of citizens. In this regard, the Member States have agreed on an EU-wide target for a European education area, which foresees that by 2030 at least 45 % of 25-34-year-olds will have completed tertiary education. In 2020, this share was 40.5 % in the EU, 8.3 percentage points higher than in 2010 (figure below). But there are marked differences between countries. Eleven states

have already reached the EU level target, and of the countries with tertiary completion rates below 45 %, only Romania and Italy have not reached 30 % in 2020. Taken together, these factors point to persistent difficulties in terms of equity and access to education and training.

Figure 2. Tertiary completion rate by country, gender, and citizenship (2010-2020), and the area European Education Area target for 2030 (in %, 25-34 years)



Source: Eurostat (2020).

As per the Eurostat data, in 2020, there was a greater decline in terms of employment rate of recent graduates aged 20-34, which fell by 4.7 percentage points for the low-skilled and by 4.5 percentage points for those with general secondary education. Employment rate of new high school graduates aged 20-34 decreased by 3 percentage points, from 79.1 % in 2019 to 76.1 % in 2020, with three countries recording a decrease of more than 10 percentage points (Spain, Cyprus, and Lithuania).

Moreover, the shock of the COVID-19 pandemic has reversed the six-year trend of declining numbers of young people who are not involved employment, education, or training (NEET). Reducing the share of NEET aged 15-29 from 12.6 % in 2019 to 9 % in 2030 is one of the complementary EU targets set out by the European Commission in its Action Plan for the EU's Employment Pillar of Social Rights (Joint Employment Report, 2023).

5. Case Study / Findings: Education in Romania

In 2022, on average, 10 % of young people (aged 18-24) in the EU were early leavers from education and training, in other words, they had completed at lower secondary education and had not pursued further education or training of any kind, and the target for this indicator is to fall to less than 9 % by 2030 (Education and Training Monitor, 2022).

In the case of Romania, more than 254,000 young people aged 18 to 24 (15 %) will have completed 8th grade or less in 2022, up from 15.3 % in 2021 and 15.7 % in

2020, according to Eurostat. In comparison, in 2018 the share was 16.4 % (268 235 young people) and in 2017 - 18.1 % (297 436 young people). Every year more than 300 000 children drop out of school, and half of them live on the edge of subsistence. In addition, Romania ranks first in the EU ranking of functional illiteracy (42 % of 15-year-olds). In another vein, Eurostat data show that Romania has the lowest share of the national budget allocated to education, almost twice the European average (Romania Country Report, 2022).

The identified barriers to accessing educational services in the post-pandemic context are economic and material. Poverty, social problems, and school segregation are the main drivers of the education gap. Thus, children from poor families are among those most affected. In many cases, income levels do not allow prioritising the purchase of equipment and tools for their digital use, nor of internet subscriptions.

Regional educational disparities in Romania also play an important role in understanding this issue. According to the *World Development Report* published by the World Bank in 2021, there are 4 regions in Romania where more than 30% of the population has never used a computer: South-Muntenia (37 %), North-East (33 %), South-East (33 %) and South-West Oltenia (31 %). At the opposite pole are the Bucharest-Ilfov Region with 10 % and the West Region with 19 % of citizens who have never used digital devices (World Bank, 2021). Thus, the study shows us that children born in poor regions would be less competent than those born and raised in economically developed areas, so I can conclude that the level of education is closely related to the level of development and urbanisation of the country.

According to *Quantitative analysis and labour market in Romania Study*, only 10 % of Romania's population had digital skills above the basic level in 2019, with Romania ranking last in the EU in this respect (KPMG, 2019). Alarming is the fact that only 20 % of the market needs for professionals in technology, engineering and science are currently covered in Romania, and the gap between universities offer and labour market demand is widening, due to under-delivery and under-achievement of skills needed in the jobs of the future, mismatches with the needs of the real economy in full swing, and labour migration. As a result, 1 in 4 employees in Romania will remain low-skilled, according to the DESI 2022 country report (DESI, 2022).

However, it is not enough to be only formally educated. Digitising education, smart automation, digital skills, and creativity in an age of technology is a necessity, not an option. As a result, our most valuable resource, the human resource, needs to benefit from continuous exponential learning and all its implications, so that today's young people become tomorrow's whole and functioning adults.

Education is a condition of existence. Digitised education offers a chance to adapt to changes and develop in a European area and beyond, starting at home, through a series of measures and reforms, aligned with *Romania's National Strategy for Sustainable Development 2030* (Department for Sustainable Development of the Romanian Government, 2017).

Thanks to the EU's resilience and recovery mechanisms under the *NextGenerationEU* instrument, Romania has outlined its €29.2 billion modernisation

plan through reforms. According to the 2022 *Country Report on Romania* (European Commission, 2022), the *National Recovery and Resilience Plan (NRRP)* will support education and skills development, allocating 12.4 % of the total budget to such measures (Minister for European Investment and Projects, 2022). Education will receive €4 billion from the NRRP in this context, of which €3.6 billion will be allocated to "Romania Educated" (Romanian Ministry of Investment and European Projects, 2022). By the end of the implementation of the programme, 6176 schools will receive technology and resources to equip computer labs, 75 000 classrooms will be equipped with modern furniture and 50 schools will be energy neutral, 2 000 green minibuses will be purchased to transport pupils and 130 crèches will be created.

In addition, 1175 SMART Labs will be purchased for secondary and high schools, the use of which will contribute to exponential knowledge accumulation. Thanks to the use of 4.0 technologies, pupils will benefit from augmented virtual reality simulations, which will help them to develop digital and technological literacy skills, stimulate creativity, memory, transdisciplinarity, critical and analytical computational thinking. Thus, the Exponential School aims to increase flexibility and adaptability to a technologically fast-paced world through the intelligent digital educational labs created by INACO in 2019-2021.

Another project to digitise education in Romania is the Strategy for the Digitisation of Education in Romania 2021-2027, which aims to make 90 % of Romania's population digitally literate and to link education with the jobs of the future (Romanian Ministry of Education and Research, 2021). This will give teachers and students free access to computer applications and software to help them in their learning and school projects, stimulating creativity and building digital skills. In this regard, Romania provides an employment subsidy for people aged 16 to 29 registered with the public employment services, according to Principles 1 and 3 of the pillars (on education, training and lifelong learning and equal opportunities).

At the European level, the European Commission is addressing these issues through its flagship policy initiative, the *Digital Education Action Plan (2021-2027)*, with a set of actions, namely:

- *SELFIE* instrument (Self-reflection on Effective Learning by Fostering the Use of Innovative Educational Technologies);
- Working with the European Investment Bank (EIB) through the *InvestEU* programme, to enable Member States to access funding for digital and physical infrastructure and to support the development of innovative skills and pedagogies;
- Digitisation of the *Erasmus+ 2021-2027* and *European Solidarity Fund* programmes;
- The *European Social Fund* to promote the development of digital competences as a means of ensuring better and fairer employment opportunities for European citizens;
- Development of the new *Digital Europe (DIGITAL*) programme with a specific focus on boosting advanced digital skills.

6. Conclusions

In an ever-changing society, digital skills will greatly determine competitiveness and the ability to drive innovation, being a pull factor for investment and a catalyst in the virtuous circle of job creation and growth, enhancing social cohesion. Artificial intelligence and new technologies have the potential to address some of today's biggest challenges in education, innovate teaching and learning practices and ultimately accelerate progress towards SDG 4. However, these rapid technological advances inevitably bring multiple challenges and risks, which have so far outpaced regulatory frameworks and policy debates.

Nevertheless, the quality and relevance of education and training available, including teaching standards, varies widely. Poverty, social exclusion, and lack of access to social and health care lead to increasing educational disparities, so the level of education is closely linked to the level of development and urbanisation of the country. This contributes to widening disparities in countries' economic and social performance, while stronger education and skills policies are key to shaping innovation and facilitating increased convergence with the best performing countries. In this context, skills (STEM, SMAC, cross-disciplinary knowledge) are a pathway to employability and prosperity. Their acquisition and development are essential for integrating the jobs of the future.

However, we are aware that Romania's education system still faces substantial challenges in terms of equity, inclusiveness, and quality of education. Despite recent progress, the school drop-out rate remains very high, highlighting existing socio-economic disparities. In this respect, the digitisation of education should be supported through a series of reform measures and good politics. For example, the Digital Education Action Plan and Smart digital learning LABs come to support inclusive and equitable digital education without discriminating and marginalising.

Taken together, these aspects should enable us to design and create an educational infrastructure that meets the needs of the population in order to provide access to inclusive quality education, accessible lifelong learning, and jobs that meet the challenges of the future in the context of the 2030 horizon. But for this, more transparency in the allocation of funds and greater investment in the education sector are needed. Moreover, policies, should promote equitable and inclusive access to digital education, with focus on empowering girls and women and disadvantaged socio-economic groups.

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