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How Digital Inclusion Increase Opportunities for Young People: Case of NEETs from Bulgaria, Romania and Turkey

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Abstract: This paper examines the perspectives of rural NEETs in the information society. Our analysis focuses on the situation of three European countries—Bulgaria, Romania, and Turkey—characterized by a high share of rural areas and a population of NEETs. From a methodological point of view, we use alternative research methods (secondary data analysis) with statistical methods (simple linear regression). From a theoretical point of view, we will opt for a multidimensional analysis perspective: the theory of digital divide, digital inclusion, virtual mobility, etc. Through data analysis, we expect to obtain a more complete and detailed picture of the ICT situation in rural areas (level of digital skills, level of digital inclusion) to demonstrate the importance of ICT in optimizing virtual mobility for the living conditions of the population, especially the NEET population.

Keywords: digital inclusion; virtual mobility; rural areas; NEETs

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1. Introduction

ICT creates prerequisites for being part of the global network and is linked to the upgrading and dynamic flow of information, fast communication, and easy access to various institutions. This is related both to opportunities and challenges, deepening inequalities, and emerging problems. People of different ages, professions, and settlements have different levels of technological skills, and there are differences between them in terms of access, use, and the skills they have to work with digital devices and the Internet. Digital skills form an essential part of key competencies, which is an indicator for the development of society, the level of competence of the population, and the readiness to accept new challenges in the context of social transformations. Digital inclusion is one of the key factors for rural youth development and has a critical effect on NEETs (Not in Employment, Education or Training) issues. Turkey, Romania, and Bulgaria are three countries that have a higher average NEET population and a lower average of digital inclusion compared to the European Union average [1]. Evaluating the effects of digital inclusion based on lower-average countries such as Turkey, Romania, and Bulgaria will help to produce specific policies and solutions for NEET problems.

The aim of this article is to discuss and demonstrate the relationship between the digital skill level of NEETs in rural areas in 3 countries—Bulgaria, Romania, and Turkey. There are three research questions that we intend to answer in this analysis: (1) What is the current level of digital skills of young people from rural areas in the three countries? (2) What are the causes of digital exclusion among the rural NEET population in the three countries? (3) How can digital inclusion decrease the rate of NEETs in rural areas and improve the opportunities for young people from rural populations?

In terms of methodology, we applied secondary data analysis using international and national databases (Eurostat, ILO, OECD, etc.). The data were evaluated for accuracy,

and any inaccurate or improperly coded data were eliminated. Additionally, the data obtained from national and international databases were statistically processed with specific programs (SPSS) and methods (simple linear regression, descriptive analysis). From a theoretical point of view, we selected those current theories from the specialized literature that will support our approach in understanding the complex relationship between the geographical location of a population (rural environment in this case), ICT, and young people, and especially within the category of NEETs: digital divide, social and virtual mobility.

2. Theoretical Background

Our data selection followed the steps below: (1) Given the specific category of the population on which we focus—NEETs in rural areas—we will discuss the different perspectives of their approach to NEETs and also on what it means in rural areas; (2) The digital divide theories [2–5] will explain the differences between certain categories of the population with different socio-demographic characteristics in relation with ICT; (3) Our analysis will focus on NEETs in rural areas, and for this reason, we will pay special attention to rural understanding, not only from a geographical-territorial perspective, but also from a socio-occupational, economic, etc., perspective; (4) The analysis of mobility in its classical forms [6,7], or in the modern terms of virtual mobility [7], will enable us to understand what the chances that young people, especially rural ones, will be mobile are.

2.1. NEETs and ICT

In 2010, a new indicator was adopted at the EU level—NEETs—which measures the degree of social, occupational, and educational vulnerability of young people [8]. NEETs refers to the share of young people not in employment, education, and/or training. The NEET indicator therefore allows us to quantify the loss of opportunity in a country in terms of economic and social growth better than the youth unemployment rate is able to. It is nowadays the most important indicator for the description of the condition of young people on the labour market and the only one included in the 2030 Agenda for Sustainable Development Goals (SDGs) signed in 2015 by the United Nations Member States [9]. Of the 17 Sustainable Development Goals, one (SDG 8, "Decent work and economic growth", in particular, sub-point 8.6) exclusively aims to reduce the number of young NEETs and to develop and operationalize a global strategy to stimulate youth employment. However, statistical data [10] show that no major progress has been made in achieving this goal so far for multiple reasons ranging from geopolitical and social conflicts or from barriers that limit mobility to the Industrial Revolution 4.0. Eurostat data [10] indicate that at the level of the three countries included in the analysis, the share of NEETs reaches rates between 18.1% in Romania, 16.6% in Bulgaria, and 32.0% in Turkey. For these three countries, not only is SDG 8 [9] a challenge, but other SDGs aimed at disadvantaged populations such as young NEETs such as SDG 4, which focuses on quality education and also means the modernization of training programs in order to develop general, transversal, and adaptation skills that will prepare all young people for new jobs; SDG 5, which focuses on gender equality, emphasizes that women, especially those in rural areas, are increasingly excluded from education and the labour market but that sustainable development cannot be achieved when part of the population is marginalized, socially, and professionally excluded; and SDG 9, which focuses on infrastructure, industrialization, and innovation is significantly increasing access to information and communication technologies but also emphasizes the most disadvantaged (young people living in isolated rural areas, those from disadvantaged families, etc.) need to be supported to benefit from TIC. In achieving these objectives, not only should the particularities of the countries be taken into account, but the different categories of population must be taken into account as well.

Contrary to the perception that this category consists of a single type of person, NEETs are characterized by a high level of heterogeneity with a wide variety of profiles and experiences [11]: women and men, young people with a high level of education and young

people without education or with a very low level of schooling, young people who come from different socio-economic backgrounds, people from rural or urban areas, people who are of different ages, etc. Arguing that the NEET category is a complex one tends to often be reduced to the issue of youth unemployment, and for this, it is very important to consider all of the situations that make people vulnerable, including with ICT.

ICT has already shown that it has the capacity to change social systems quickly and significantly: most jobs that will be created in the coming decades will require advanced digital skills. Continuing education and training services, health services, financial, entertainment, and civic participation will mainly be provided through ICT. In most countries, digital skills have already become an eliminatory criterion in the selection of candidates for employment, and for young people, especially those from disadvantaged categories (young people leaving school early, young people with disabilities, young people in rural areas, etc.) who do not have such skills, ICT is a barrier to their active participation in the labour market. In general, in most countries, young people, whoever they are, are seen as "digital natives" who are incredibly competent in using ICT in everyday life in any activity they carry out. In reality, the situation is much more complicated, and in most cases, young people have shown that they do not have those digital skills solicited by the labour market, in the process of education and training, in social relations, and so on. Thus the risk of becoming NEETs is much higher in the digital age.

Countries are proving that they are not prepared to face these changes. Part of the proofs is the fact that analysis of NEETs in relation to ICT is rarely studied although this may be one of the most important vulnerabilities that young people face in the digital age.

The relationship between NEETs and ICT is complex and relatively difficult to analyze. On the one hand, NEETs are an "umbrella" [12,13] under which there are young people with extremely different situations: young and unemployed, young people who do not have a job because they have family members in charge, young people who expect an opportunity to better match their professional and social aspirations, etc. On the other hand, we have ICT, another "umbrella" that covers both the social and the technical dimensions. First of all, it is about different categories of population: people who do not have the necessary education to use ICT, others who do not have motivation, others who do not have financial possibilities to purchase ICT technology or services, or there are situations in which there is motivation and availability, but the authorities do not provide this type of service. Secondly, the complexity of ICT comes from other dimensions that include infrastructure, content, knowledge management, etc. The combination of NEET categories and the dimensions of ICT generates a multitude of situations. Data analysis through simple linear regression allows us to estimate which of the variables and dimensions have a determining role in the mobility or immobility of young people from rural areas.

2.2. Digital Divide, Digital Skills, Digital Inclusion

The digital divide is a relatively new phenomenon that attracted specialists in the second half of the 1990s [14] when, due to the accelerated informationalization of most fields, certain categories of people did not benefit from these opportunities. One of the best-known definitions belongs to the OECD, which understands the digital divide as "the gap between individuals, households, businesses and geographical areas at different socio-economic levels, both in terms of their opportunities to access information and communication technologies and the use of the Internet for a wide variety of activities. The digital divide indicates differences between countries, but also within countries" [15]. According to Van Dijik [2], the development of a conceptual framework took place after the year 2000 with the accelerated development of this field. After the year 2000, because ICT became more and more present in the lives and activity of the population, new concepts—digital competences, digital skills, digital inclusion, digital equity, etc.—appeared. The concept of digital competence is an emerging and reinforcing concept related to technology development as well as to the political goals and expectations of citizenship in a knowledge society. Digital competence covers many dimensions [16], the most important of which is

for our topic consists of technical skills for using digital technologies and digital inclusion. The European Commission [17] defines digital competence as including the confidence and critical use of information society technologies for work, leisure, and communication. It is based on the core ICT skills, that is, the use of computers for the extraction, evaluation, storage, production, presentation, and exchange of information as well as communication and participation in Internet collaboration networks [17]. Digital competency is described as a confident, critical, and creative use of ICT to achieve goals related to work, employability, training, recreation, inclusion, and/or participation in society [18]. Digital competences are seen as a crosscutting key competency enabling people to acquire other key competencies such as learning and critical skills, cultural awareness, etc. [19]. The relationship between competence and skills is defined in the OECD publication and states that "a competency is more than just knowledge and skills. It involves the ability to meet complex demands, by drawing on and mobilizing psychosocial resources (including skills and attitudes) in a particular context" [20].

Both the European Commission [17] and the OECD [15] draw attention to the fact that although ICTs have increased, there is still a significant division in the capacities of the population. From the perspective of the same documents [17,20], digital inclusion refers to the activities necessary to ensure that all individuals and communities, including the most disadvantaged, have access to and the use of ICT and insists that specific programs, strategies, and investments are needed to remove all barriers to accessing and using these technologies. From the point of view of the SDGs [9], economic, social, and territorial inequalities must have a priority position on the agenda of decision-makers in order to distribute the benefits of digitalization in a homogeneous way, especially in the labour market, and especially in regard to the labour market providing a sufficient level of stability for young people.

2.3. Rural Areas

In general, studies on ICT and mobility—regardless of the form it takes—focus on the urban environment. In recent years, however, rural areas have become the center of mobility studies from various perspectives [21].

In most literature, it is particularly argued that the definitions of rural have many features that state rural areas as existing along a continuum within which individuals, households, communities, and institutions distribute themselves. One important characteristic of rural environments is the dynamic nature in which social forms and arrangements are created, modified, and discarded [22].

The concept of rural is a generic one that covers distinct realities from one country to another, from one stage of development of society to another. The most common definitions of rural refer to either the predominant occupations of the population—"territories of a country that show signs of excessive land use both now and in the immediate past" [23] or population density—the term rural is conventionally used to designate a delimited geographical area, characterized by a small population, with a low density and relatively isolated from the influence of large metropolitan centers" [21]. At the EU level, the OECD definition based on population density has been adopted: those settlements/areas where the population density does not exceed 150 inhabitants/km^2 are considered rural settlements [21]. The official adoption of a definition allows comparisons to be made between European states and the identification of country specifics, common points, and differences between countries and, obviously, unitary action for rural development. At the same time, however, the EU allows each member state to create its own rural concept. In Bulgaria, Romania, and Turkey, the rural areas are defined mainly by the dominant occupation of the population—agriculture, positioning—outside urban areas, and through the socio-economic level compared to urban areas.

On the other hand, the term "rural" is a concept that lacks an agreed definition and that encompasses a range of different geographic situations. Indeed, it has been argued that academic definitions of "rural" often bear little resemblance to residents' understanding

of the term [24] and even that the terms "rural" and "urban" can be more confusing than illuminating [25].

For decades, rural communities have been characterized by an abundance of resources that have managed to ensure if not the well-being, then the survival of the inhabitants. Technological, political, and economic changes have led to transformations in rural areas with an impact on the rural economy, the way of life of rural communities, and the relations between rural and urban spaces. Rural has become a very complex problem, the solution of which requires finding a balance between preserving the traditional values of the rural space and the need to modernize it.

In the context of the SDGs [9], rural development must be based on sustainable development through a series of essential characteristics aimed at sustainable rural development, which implies fair and balanced economic development for all inhabitants; extensive or integrated rural development, which refers to the development of the rural environment by expanding the means of communication and information; and multisectoral rural development, which refers to the creation of networks and partnerships between international organizations, national agencies, or civil society organizations. ICT can be the link between these entities.

In many countries, including Bulgaria, Romania and Turkey, rural areas are characterized by underdevelopment and poverty. Young people in rural areas face three types of deprivation related to households, opportunities, and mobility [26]. Household deprivation relates to constraints caused by low income and poor housing, which frequently co-exist in rural areas. Opportunity deprivation is linked to a lack of jobs and services. In turn, people's inability to find acceptable jobs or to obtain services leads to mobility deprivation. The accumulation of different forms of deprivation can lead to the isolation of particular groups in rural areas. Additionally, in these three countries, unemployment and the underemployment among young people have been seen as a particular cause for concern, and a key issue in rural communities is the lack of employment opportunities and career choices for young people. Indeed, research suggests that members of rural communities tend to express a great deal of concern about the problems faced by young people in the labour market and their lack of access to further education and training. There is also evidence suggesting that recent changes in the labour market (especially the decline in "traditional" rural employment in agriculture and small manufacturing units and the increase in part-time and temporary jobs in the service sector) have had a particularly strong impact on the experiences of young people [26].

In relation to ICT, according to some researchers, rural areas are considered "fragile areas" [27] from ICT resources, characterized by a lack of access to a diversity of technology offerings, and the rural population is characterized by a higher risk of digital exclusion compared to the population in urban areas. Due to the particularities of rural areas, researchers and administrative institutions from the national and international level (EU, OECD) are interested in how ICT could facilitate rural development. The main role of ICT in facilitating such developments must be analyzed in a comprehensive sense as a means to increase the levels of competence and competitiveness in all areas of life, including social, economic, cultural life, etc.

The development of ICT in rural areas can lead the population, especially young people, to become mobile—from a virtual point of view—changing their socio-economic, professional positions and remain in the community at the same time. ICT helps to reduce rural depopulation and allows the population to achieve their personal achievement goals at the same time. Access to digital platforms and online services for education, health, administration, tourism, and commerce is becoming exponentially important in counteracting the depopulation of rural and remote areas. Digital technologies are important for the sustainability of rural communities. They support generational renewal by helping to make rural areas fit for the future by enabling citizens to have equal access to the opportunities available in urban areas. They make rural areas places where people can thrive.

2.4. Mobility

Mobility represents an important shaper of rural lifestyles and rural places. The concept of mobility can be analyzed from several perspectives. Most frequently, the mobility—social mobility—is analyzed in relation with the processes of industrialization [28,29] because the latter produces changes in the social structure: the population changes the status-roles that had previously been held in high regard in a certain stage of development in favour of new ones brought in by a new stage of development, which tend to hold higher value and bring in a new social structure. In societies that allow mobility, status acquired roles become dominant at the expense of the inherited social structure and are lighter and more permeable, providing opportunities for development and reaching broader categories of the population.

Industrialization has led to increased territorial (spatial) mobility of the population in which individuals and households have moved to a longer or shorter distance outside of the community of origin [30]. Studies on territorial mobility have concluded that displacement occurs as a result of inequalities that characterize society and can be perceived as an attempt to reduce existing social imbalances, bringing society to a stage of relative equilibrium. The less-developed rural area was an important source of territorial mobility, and the young people, at the beginning of their social, family, professional lives, are the most mobile category of the population. For rural areas, increasing the territorial mobility of the young population is, in most cases, a loss of human capital and an increase in the risk of poverty.

Industrial Revolution 4.0. created the possibility of another type of mobility—virtual mobility [18], which does not cancel the classic variants, but improves them by making them more accessible to the population the positions located at the top of the socio-professional hierarchy. At the EU level, virtual mobility means "a form of learning which consists of virtual components through a fully ICT supported learning environment that includes cross-border collaboration with people from different backgrounds and cultures working and studying together, having, as its main purpose, the enhancement of intercultural understanding and the exchange of knowledge" [19]. Thus, ICT is becoming an important "vehicle" in the mobility of the population.

We observe that mobility is not always equivalent to movement but can be the possibility, the potential, and the virtuality of movement. Additionally, compared to other industrial revolutions that take effect for several generations, the digital revolution produces significant effects in a much shorter time, sometimes within the same generation. This type of mobility represents, especially for rural areas, a chance for development. Virtual mobility contributes to reducing economic and social imbalances between rural and urban, without the need for physical movement of the population. The digital revolution permits young people to have upward mobility by increasing learning opportunities due to labour market requirements; by diversifying employment opportunities; and by increasing revenues as a consequence of increasing the level of training and qualification. However, this type of mobility is only possible if the population has access to ICT: infrastructure, content, and skills. For the disadvantaged categories of the population, including those living in rural areas, the digital revolution represents a great chance—to advance educationally and professionally—but also presents a great risk: the deepening and the acceleration of the phenomenon of social exclusion and digital exclusion. The chance comes from the fact that, through the use of ICT, the additional costs of transportation from school/work to home, accommodation, food, etc. are limited or even excluded. Moreover, the same digital tools can be used by multiple family members over a long period of time, which reduces the investment. In other words, young people now have the chance to learn from a good school and to have a well-paid job without moving from the locality in which they live. Risk is determined by the quality and existence of ICT, access to digital skills training as well as motivation and interest in using these tools. Youth in rural areas with limited access continues to lag, hindering their growth and development. There exists a reciprocal relationship between rural mobilities and the dynamics of place. The paradigm of mobility is becoming increasingly central to contemporary identity formation and re-formation [31].

There is an appreciation of both the temporalities and spatialities of mobility. Moving beyond the obvious observation that mobilities involve movement across space and between places, there is recognition that places and the processes of place-making represent important components of these mobilities. As Urry suggests, "places are economically, politically and culturally produced through the multiple mobilities of people, but also of capital, objects, signs and information" [32].

The mobility discourse has also been influential within human geography, where a distinctive body of work is now identifiable [33,34].

The relationship between mobility and place attachment have been challenged in another way by Barcus and Brunn [35], who argue that out-migration does not necessarily diminish attachment to place. Broadening the understandings of place attachment, they utilise the idea of place elasticity [35] to embrace the possibilities of virtual relationships with distant places. "The elasticity of place allows individuals to maximise economic or social opportunities distant from the place to which one is attached while at the same time perpetuating engagement with that place. Elasticity is possible today because of the extensive transportation and communication networks that facilitate greater interaction among people in distant places" [35]. Their focus is on young people leaving the areas in which they grew up, who they suggest may have moved away from their home community but whose identity with and attachment to that place remain strong. Moreover, they contend that these mobilities have the potential to create meaningful attachments to multiple places. However, as Bracey's [36] quotation indicates, mobility has long represented a significant research theme within rural studies, both in terms of the spatial analysis of population movements between rural and urban places, and studies of the social and cultural impacts of migration in particular places. Beyond these previous studies of migration, we argue that "rural" constitutes an extremely interesting case of contemporary mobilities. Not only the rural places that are being reshaped by complex patterns of movement in similar ways to cities but also rural mobilities that offer new perspectives on the complex interplay between movement, fixity, and place as well as the everyday problem of mobility.

Rural places are characterised by a somewhat complicated interplay between mobility and fixity. Dominant cultural constructions of rurality remain heavily laden with notions of stability, rootedness, attachment to place, and localism [37].

As Bell and Os comment, "the sense of the rural as having persistent stabilities (whether this is materially true or not) is important in shaping the symbolic use of the rural throughout contemporary culture and politics" [38]. In this discursive sense, rural places would appear to be positioned at the opposite end of the mobilities spectrum to cities. However, we argue that these "persistent stabilities" are themselves fluid in nature, as they are both underpinned and undermined by a complex range of mobilities being played out in rural spaces.

Some references need to be made to virtual forms of rural mobility. Since the late 1980s, digital technology has been discussed as a potential panacea for rural problems, enabling remote rural places to connect to new global networks. Initial research attention was given to the concept of e-working, based in the home or in small offices, with these new forms of working seen as a means of reducing commuting to distant places of employment and revitalizing rural communities and economies [39]. More recently, the discussion has focused on the potential impacts of high-speed broadband technologies in rural areas. This study has explored how the Internet provides new techno-spaces for youth culture in rural areas, expanding young people's "repertoire of identities" in the local community and beyond. In addition, attention has been given to the role of new the broadband generation in addressing rural disadvantaged youth [40,41].

3. Materials and Methods

In this study, secondary data were obtained from Eurostat, ILO (International Labour Organization), and National Institutes of Statistics. The choice of these databases is supported by the fact that they provide a mapping of the three countries in terms of ICT: digital

skills, socio-demographic characteristics of the population (gender, age, area of residence), and socio-economic (unemployed, employees, NEETs) and makes comparative analysis possible. The collaboration between the international institutions empowered in collecting and processing statistical data (Eurostat, ILO, OECD) and those institutions at the national level (Institutes of National Statistics) guarantees the application of coherent procedures regarding the concepts and definitions (NEETs, for example) and standard classifications (ISCED, for example). One of the first methodological limitations is the fact that the data used are collected for a completely different purpose than the one we set out to discuss, which limits the possibilities of their exploitation and analysis. Another limit is given by the process of data transmission by national statistical authorities to international ones that can be marked by syncope that interrupt the data series and make it difficult to compare data for the same years and the same categories of population etc. The selection of data analysis methods—calculation of absolute and relative rates, linear regression—took into account the specifics of the databases.

A two-step method was used in the data analysis process. In the first stage, secondary data (number, ratio, percentage, etc.) collected in the same data set for the three countries were brought together and presented. This step helped us to identify the vulnerability of the three countries in the ICT by degrees of urbanization, socio-demographic characteristics of the population (gender, age, area of residence), and socioeconomics (unemployed, employees, NEETs). The data we have selected for this type of analysis cover the following criteria: age target population (15–24 years); the time interval analyzed (2009–2020); degree of urbanization (town, cities, rural areas); and ISCED international classification. When highlighting the differences in years and age groups, the level of urbanization rate will be calculated in both relative and absolute rates. The absolute and relative values reflect the relationship between the phenomena (level of education, unemployment, for example) and the processes of the socio-economic life of a society (digitization, for example).

For the second stage, simple linear regression analysis was used to test the influence of digital inclusion on unemployment and rural/urban population. Simple linear regression is one of the most effective analysis methods to show the relationship between a quantitative outcome and a single quantitative explanatory variable [42]. The data obtained from databases as secondary data were evaluated for accuracy, and any inaccurate or improper data were eliminated. In the linear regression analysis in this study, digital inclusion of rural youth in three countries was used as a dependent variable, and unemployment rate and rural/urban population rates were used as independent variables. Therefore, a simple regression analysis technique was used to reveal the effect of digital inclusion on the mobility of NEETs based on unemployment and rural/urban population. A standard linear regression analysis of the relationship between digital inclusion—the unemployment rate and digital inclusion-rural/urban population—is carried out for the period between 2010–2020 in three countries: Romania, Bulgaria, and Turkey. Statistical models are not without limits and errors, especially because they aim at a simplification of some dimensions of society to obtain solutions that can be used in practice. In order to reduce the risk of various errors (specification errors, transferability errors, etc.), we will pay special attention to the organization of the research data and their interpretation.

4. Data Analysis

In order to understand the relationship between ICT-mobility, rural areas, and NEETs, it is very important to understand what the main characteristics of the three countries from a socio-demographic an ICT point of view are. First, the share of the rural population in the total population of a country is important. The importance given to the relationship between rural areas and ICT is justified, at least for some European countries, by the large share of the population living in rural areas. If this category of the population does not have access to education and ICT, then an important share of the population of a country will be excluded not only from digital, but also occupational, social, civic, etc. development of the country.

The share of the rural population in the three analyzed countries—with the exception of Romania (Table 1)—is close to the average EU-28. Although in recent years (2011–2020), the population has decreased in relation with the EU-28 in the three countries—according to the results in the table—there is still talk of a critical mass of population living in rural areas. Another characteristic of the rural population in these three countries is unemployment, especially among young people. Thus, according to Eurostat [10], in Romania, more than a third of the rural population aged 15–24 is unemployed (34.8% in 2020), while in Bulgaria, the share of unemployed young people in rural areas in the same period amounts to 13.6%. According to statistics, in Turkey [26], the share of unemployed youth (15–24 years) was 25.2% in 2019 (for Turkey there are no detailed data on urbanization degrees regarding unemployment). To access the labour market, young people need education. Progress towards the SDGs and better education and employment outcomes for young people requires the adoption of ICT solutions. Additionally, ICT is very useful for the population, as it allows them to have access to various services including e-work, e-services, e-business, e-commerce, and e-learning [13].

Table 1. Ratio of population in rural areas and absolute and relative change in Bulgaria, Romania, and Turkey (2011–2015, 2015–2020, and 2011–2020).

Region	2015	2017	2019	Relative Change 2015–2017 (Absolute Change 2015–2017)	Relative Change 2017–2019 (Absolute Change 2017–2019)	Relative Change 2015–2019 (Absolute Change 2015–2019)
EU	26.83194 (0.27%)	26.09182 (0.27%)	25.05476 (0.25%)	0 (0)	−0.02pp (−8%)	−0.02pp (−8%)
Bulgaria	27.362 (0.27%)	26.01 (0.26%)	24.314 (0.24%)	−0.01pp (−0.84%)	−0.02pp (8.33%)	−0.03pp (−12.5%)
Romania	46.04 (0.46%)	46.113 (0.46%)	45.806 (0.46%)	0 (0)	0 (0)	0 (0)
Turkey	28.598 (0.28%)	26.389 (0.26%)	23.895 (0.24%)	−0.02pp (−7.7%)	−0.02pp (−7.7%)	−0.04pp (−16.66%)

Source: Eurostat, 2020 [edat_lfs_9913].

Eurostat data [10] show that in the vast majority of households in the three countries, there is access to ICT. The share of households with internet access has doubled in recent years in all three countries [10]: from 51% in 2012 to 79% in Bulgaria in 2020; from 54% to 86% in Romania; and from 47% to 91% in Turkey. The same data shows us the most important activities for which people use ICT in all three countries. The technology is used by more than 50% of the population for social networking, and less than10% of the population from all 3 countries uses ICT to look for a job or education, etc. [10]. Eurostat data confirm the concerns expressed by the UN: "digital natives" and access to the ICT do not mean skills required by the labor market. Additionally, communication through social networks is not considered as a high level of digital skill. The use of ICT at maximum capacity requires a certain level of education and certain digital skills. Studies [43] on rural areas show that the level of education is much lower compared to urban areas in most countries. Bulgaria, Romania, and Turkey are no exception. In Bulgaria and Romania [26] as well as in Turkey [28], the urban population in the vast majority—over 60%—manages to complete the secondary level of education (ISCED 0–4). Regarding the rural population, in Romania and Bulgaria, the share of those who complete ISCED 0–4 in 2019 was 44.9% and 48.1%, [10] respectively, while in Turkey it was a little over 5% [44]. In the conditions of ICT expansion in all fields of activity and in all sectors of life, a low level of education leads to limited digital skills and together are no longer an individual problem, but have become a significant one for the entirety of society. Although low digital skills they have a direct relationship with other types of problems: the difficulty of finding a job, access to social

networks, health services, and most importantly, obstructing the mobility of the population from rural areas. Thus, we see that it is not sufficient to provide ICT for households in urban or rural, but it is necessary for ICT to be truly useful for the need of developing specific skills.

The relationship between the level of education and digital skills is a direct one in all three countries (Table 2): when the level of education increases, the number of individuals with lower overall digital skills decreases. The most important decreases in the share of the population with low digital skills are registered in Turkey (−15pp/−214.28) during the whole period considered 2015–2019. The relationship between education and the level of digital skills confirms that even in the case of virtual mobility, education is the most important variable. For the rural population, and especially for young people, going through a classic mobility process through which to reach a higher level of education than their parents in order to get a better-paid job is more difficult. Young people in rural areas (as well as their families) have to incur additional costs (transport costs, costs associated with living in urban areas away from their rural area of origin) if they want to continue their schooling. Additionally, the urban environment has many more generous jobs offers compared to the rural environment, but even in this case, the costs that a young person from a rural area has to cover are higher. Some researchers [45] believe that it is precisely these obstructions generated by the difficulty of mobility that explain the increase in the rate of NEETs in rural areas. However, virtual mobility could facilitate their social and professional rise. This requires access to education and access to digital skills training. The idea is supported by the EU on strategies for competencies [46] focused particularly on the development of training programs for the rural population, increasing awareness, and providing training on the exploitation of ICT in order to contribute to rural development and reducing the share of NEETs.

Table 2. Individuals who have basic overall digital skills and educational level in Bulgaria, Romania, and Turkey, including absolute and relative rate compared to EU countries average.

Value	Region	2015	2017	2019	Relative Change 2015–2017 (Absolute Change 2015–2017)	Relative Change 2017–2019 (Absolute Change 2017–2019)	Relative Change 2015–2019 (Absolute Change 2015–2019)
Individuals aged 16–24 with low education	EU	17%	20%	20%	3pp (15%)	0 (0)	3pp (15%)
	Bulgaria	29%	37%	37%	8pp (21.62%)	0 (0)	8pp (21.62%)
	Romania	34%	45%	40%	11pp (24.44%)	−5pp (−12.5%)	6pp (15%)
	Turkey	37%	32%	40%	−5pp (−15.62%)	8pp (20%)	3pp (7.5%)
Individuals aged 16–24 with medium formal education	EU	15%	14%	15%	−1pp (−7.14%)	1pp (6.66%)	0 (0)
	Bulgaria	21%	32%	33%	11pp (34.37%)	1pp (3.03%)	−9pp (−27.27%)
	Romania	32%	37%	39%	5pp (13.51%)	2pp (5.12%)	7pp (17.94%)
	Turkey	32%	18%	20%	−14pp (−77.7%)	2pp (10%)	12pp (−60%)
Individuals aged 16–24 with high formal education	EU	4%	5%	5%	1pp (20%)	1pp (16.66%)	2pp (33.33%)
	Bulgaria	9%	21%	14%	12pp (57.14%)	−7pp (−50%)	5% (35.71%)
	Romania	16%	16%	30%	0 (0)	14pp (46.66%)	14pp (46.66%)
	Turkey	22%	8%	7%	−14pp (−175%)	−1pp (−14.28%)	−15pp (−214.2%)

Source: Eurostat, 2020, [isoc_sk_dskl_i].

All three countries encounter a high share of the NEET population. In Romania and Bulgaria, the NEET rate in rural areas is 44.5% (2019) 33%, respectively, which is one-third more than the rate in urban areas [10]. According to ILO data [47] in Turkey, the rate of NEETs is 38.9% in rural areas, whereas 61.1% of youth NEETs live in urban areas.

The data (Table 3) indicates an important aspect: both in Bulgaria and in Romania, but also in Turkey, women are found in a larger percentage in this category compared to men. According to the data [9], and not only in the three countries included in the analysis, we are dealing with gender discrimination: girls and young women make up the majority of the world's 621 million young people who are not in education, employment, or training, and unemployment is affecting young women more than young men in almost all regions of the world. In these conditions, realizing gender equality and the empowerment of women and girls will make a crucial contribution to the progress across all of the SDGs goals and targets. Gender distribution is very important, especially in rural communities, which are much more traditional compared to urban areas. Women have a very important role in the process of the socialization and education of children, especially in rural communities, so improving the attitude and behaviour of young people must begin by educating mothers. The gender dimension characteristic of the NEET population in the three countries is transferred to the level of access to ICT and the level of digital skills. According to the OECD (2007) [48], women are underrepresented in both dimensions of ICT: access and skills. Thus, the chances of women to leave NEET status, especially in the digital age, is very low. The extension of social networks through ICT would also contribute to changes in attitudes and behaviour among young people towards education, occupation, and civic involvement and would increase the chances of "breaking" the vicious circle of inter and intragenerational poverty. Until then, however, the rural populations of the three countries are characterized by difficulties in accessing education, reduced job supply, economic difficulties, etc., and an important portion of young people are included the most vulnerable group—NEETs.

Table 3. Rural youth NEET population in Bulgaria, Romania and, Turkey (%).

Year	Bulgaria		Romania		Turkey	
	Female	Male	Female	Male	Female	Male
2010	20.1	23.2	22.1	22.1	20.7	19.2
2011	23.6	26	23.7	24	19	15.5
2012	26	29.5	23	22.2	17.8	14.6
2013	25.7	30.2	24.6	23.2	19.7	15.5
2014	23.7	23.8	24.7	23.6	20.2	16.6
2015	22.3	21.2	23.4	20.6	22.2	16.5
2016	16.9	17.4	21.8	19.9	23.5	17.2
2017	12.4	13.3	18.6	18.1	25.6	17.7
2018	11.9	13.2	16.2	16.3	25	17.5
2019	8.3	9.3	17.5	16.3	30.3	22.4

Source: ILO, 2020 [SDG_0861_SEX_RT_A,].

The secondary data analysis reveals that in Bulgaria, Romania, and Turkey, the main characteristics of the rural population are a high share of the rural population in the total volume of the population, a low level of education, and a high share of unemployment. Once we identified the main characteristics of the rural population that are likely to influence access to ICT and digital skills, we moved on to a more detailed statistical analysis to better describe their impact on mobility.

In the next part of the article, we will test a number of variables to determine which of them are relevant to increasing the virtual mobility of young people in rural areas.

5. Empirical Approach and Discussion

Through specific statistical methods, we tested several variables likely to explain the relationship between virtual mobility and rural populations. Digital exclusion can lead to a multitude of situations of exclusion [10]. Exclusion from the labour market is one of the most important problems caused by digital exclusion. The causes of unemployment are multiple, but our analysis will focus on identifying the role that digital exclusion plays in the chances of professional integration for young people in rural areas. The existence

of a significant NEET population in the overall rural population is another situation to be tested to see the impact on virtual mobility.

Table 4 shows the linear regression analysis results of three countries. Analyzed data consists of the digital inclusion values of rural youth between 2010–2020 in three countries as the dependent variable and unemployment rate of rural youth between 2010–2020 in three counties as the independent variable. Results of the analysis showed that there is a positive relation between the unemployment rate and digital inclusion rate (Romania $R^2 = 0.91$, Bulgaria $R^2 = 0.89$, Turkey $R^2 = 0.76$). That positive relation is lower in Turkey compared to Romania and Bulgaria. The reason is that Turkey's rural youth have a lower digital inclusion rate compared to Romania and Bulgaria. This means that increasing access to ICTs and the digital development of Romania and Bulgaria have better chances to increase the rate of professional integration of young people from rural areas. Thus, young people have the chance to be mobile (virtual) and contribute to the development of community belonging. Turkey's situation is unfavourable: investing only in ICT in rural areas is not sufficient. Young Turks from rural areas having chances of mobility (virtual) and the development of rural communities to be attractive primarily requires investment in the better education of young people. ICT brings back the relationship between the environment of residence and the job supply: the authorities must understand that jobs follow people and that the situation is rarely reversed [49]: where there are human resources, and especially young resources, technology can develop market work. Through ICT, the population has access to education, builds its social networks (social capital), and then has access to the labour market. The NEET status accumulates all of the vulnerabilities that a young person may face, including in terms of ICT, as we pointed out during the analysis. Is digital inclusion a solution for reducing and eliminating vulnerabilities?

Table 4. Relation between the unemployment rate and digital inclusion of rural youth.

Dependent Variable	Independent Variables	R	*t*-Value	*F*-Value	R^2	*p*-Value
Digital inclusion	Unemployment Rate of Rural Youth in Bulgaria	0.943	58.9	57.24	0.89	0.00013
	Unemployment Rate of Rural Youth in Romania	0.955	20.52	73.40	0.91	0.00002
	Unemployment Rate of Rural Youth in Turkey	0.87	0.63	19.37	0.76	0.00041

Source: Authors' ad hoc elaborations on ILO date.

Analyzed data (Table 5) consist of digital inclusion values of rural NEETs in the three counties as dependent variables and the rural and urban population of rural youth between 2010–2019 as independent variables. Results of the analysis showed that there is a positive relation between the rural/urban population numbers in Romania and Bulgaria and digital inclusion rates (Romania Rural $R^2 = 0.84$, Romania Urban $R^2 = 0.83$, Bulgaria Rural $R^2 = 0.82$, Bulgaria Urban $R^2 = 0.83$). This relation shows that digital inclusion is a decisive factor for decreasing the rural youth NEET population in Romania and Bulgaria. Digital inclusion has similar effects on rural and urban populations in the two countries. In contrast to results for Romania and Bulgaria, there is no meaningful relation between digital inclusion and rural/urban population change (Turkey Rural $R^2 = 0.27$ Turkey Urban $R^2 = 0.11$). Although rural and urban youth NEET populations decrease over time in Turkey, digital inclusion rates did not increase as they did in Romania and Bulgaria. As it has been mentioned, the analysis of the relationship between NEETs–ICT and rural youth–ICT mobility is a complex fact revealed by the statistical results. The higher level of education of the rural population is a solution for reducing the population of NEETs in all three countries, especially in Turkey. Digital skills are considered as a major factor to decrease the share of this portion of individuals in rural populations as well as being important to foster mobility, but not alone. Detailed statistical analysis demonstrates that

ICT can play an important role in rural development, increasing virtual mobility, but only when associated with other types of interventions: education, job offers, the development of social networks, etc.

Table 5. Relation between rural/urban population of youth NEETs and digital inclusion.

Dependent Variable	Independent Variables	R	*t*-Value	*F*-Value	R^2	*p*-Value
Digital inclusion	Rural Population of Youth in Bulgaria	0.91	42.98	38,85	0.82	0.00025
	Urban Population of Youth in Bulgaria	0.91	35.65	40.40	0.83	0.00021
	Rural Population of Youth in Romania	0.91	16.67	42.45	0.84	0.00018
	Urban Population of Youth in Romania	0.94	21.69	65.63	0.89	0.00003
	Rural Population of Youth in Turkey	0.52	3.03	2.67	0.27	0.146191

Sources: Authors' ad hoc elaborations on ILO data.

To achieve two goals—digital inclusion and virtual mobility growth in rural areas—NEETs need some punctual interventions. A schematic representation (Figure 1) highlights actions that should be taken in the three countries and highlights the following issues:

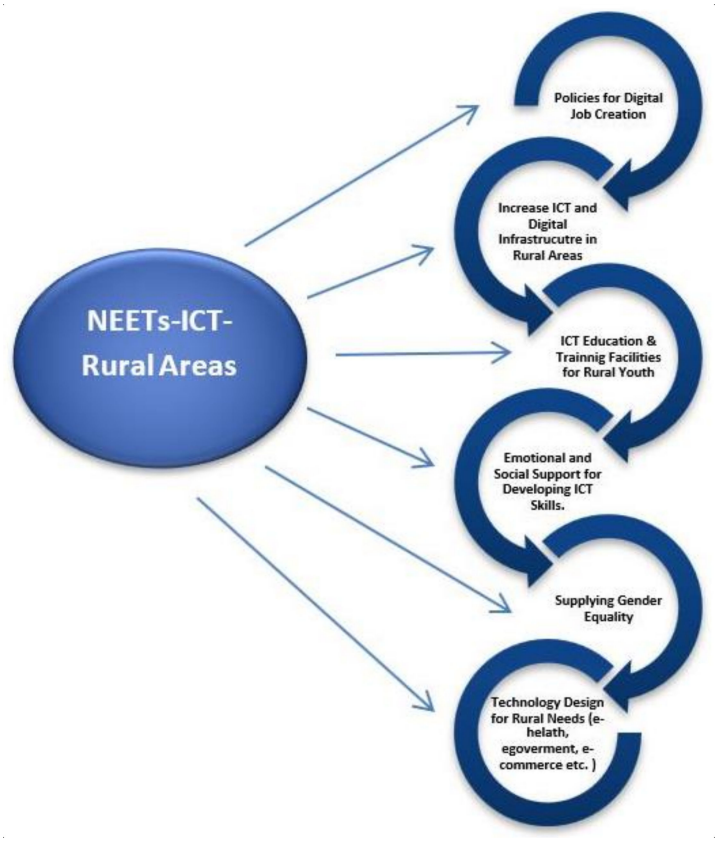


Figure 1. Actions to improve the relationship between NEETs, ITC and rural areas. Source: Authors' ad hoc elaborations.

First of all, action must be taken to develop the education level of the population with an emphasis on the development of digital skills. Digital training for youth in rural areas requires technological support, the availability of high-speed internet, access to the internet, and the mastering of the rules of working with platforms in a digital environment. Education in Bulgaria, Romania, and Turkey is the area where great change and progress have been made, but there are still some systematic challenges and needs that could be made, such as insufficient attention to "second chance" schools and the lack of NEET skills matching the needs of the labour market. Secondly, all actions need to make sense or

correspond in reality: young people will be motivated to acquire digital skills if they have a suitable job offer, that is preferably also digital. Analysis of the relationship between ICT and NEETs has been the subject of numerous studies [31] that have shown that NEETs have a passive attitude in the digital world as a result of the negative experiences they had in the real world (in contact with school or with employment agencies). In the virtual world, these stigmas are lost or diluted, and even the most disadvantaged can recover or increase their self-esteem and become a successful model for other community members or groups to which they belong. Therefore, NEETs not only need to be trained to assimilate with the proactive strategies of the virtual world (job search opportunities to learn, widening social network, etc.) but also to assimilate with those in the real world, to help them change their status.

The relationship between education, occupation, and ICT in rural areas is a major challenge for authorities and others. On the one hand, the population must have equal access to all levels of education, either through physical participation or online through ICT. On the other hand, increasing the level of education creates, especially for young people in rural areas, a way to "escape". The good news is that according to recent research [50], young people do not want to leave rural areas as long as they have education and work offers corresponding to their aspirations. This should be used by the authorities to the advantage of the rural population: by encouraging virtual mobility, the chances of rural areas becoming attractive to educated young people and companies tend to increase. By facilitating access to ICTs, rural youth would not be educated "out" (in urban areas). They would not lose touch with the community where they were born and would not be tempted to leave the area. Thus, to reduce digital inequalities, not only improving the digital skills, but also changes in the real world such as increasing access to education and training for disadvantaged young people, increasing self-esteem, diversifying job offers, etc., are needed. Improving the digital skills of rural youth can be beneficial for young people to produce and acquire jobs using ICT tools and digital infrastructure. Implementations to be developed by policymakers for ICT-supported job opportunities in rural areas will be beneficial in reducing the mobility of young people. The provision of services (e-health, e-education, e-commerce, e-finance, etc.) offered by public or private institutions and used intensively by young people as individuals living in rural areas is also one of the factors that will reduce mobility. The intervention of the authorities must be carried out at all levels: facilitating access to technology (equipment), providing and training skills (digital skills), and increasing the motivation and confidence of the population in ICT (knowledge management). The management of these three dimensions of ICT in relation to rural areas has the effect of increasing the virtual mobility of the population and the medium and long term development of rural communities.

6. Conclusions

The idea of this study was to examine the relationship between the digital skill level of young people living in rural areas (Bulgaria, Romania, and Turkey) and the role of these skills in personal development through education, employment, and mobility. The secondary data analysis and the detailed statistical analyses highlighted some specific characteristics of the three countries.

First of all, the results of our analysis show that the NEET population is a complex one but, especially in rural areas, tends to be often reduced to the issue of youth unemployment. It is very important to consider all of the that cause young people to be vulnerable. NEET analysis in relation to ICT must be studied because this may be one of the most important vulnerabilities that young people face in the digital age. According to the results of the analysis, the digital skill level of young people in the countries included in the social analysis of NEETs in rural areas is very low compared to the EU average but also compared to the urban environment of their own countries. Turkey is characterized by a lower level of digital skills of young rural NEETs compared to Bulgaria and Romania.

Secondly, digital inclusion does not only mean access to ICT equipment, but also means more access to training, guiding young people to use ICT to develop personally as well as to contribute to community development, and the development of self-confidence. For all three countries, we have identified the existence of a common cause that leads to a low level of digital skills: education, or rather the low level of education of the rural population. Lack of education generates negative effects in the chain: the difficulty for young people to acquire a job, low income, increased risk of poverty, increasing the isolation of rural communities and the population living here in urban areas, etc. Not only the development of educational instruction, but also the development of ICT has the effect of increasing the chances of mobility in young people, even if we talk about virtual mobility: young people will have access to information, education, and training, which increase the chances of getting a job and more income. There is a direct relationship between virtual mobility and digital inclusion with positive effects on the population and the communities to which they belong to. The more accentuated virtual mobility is, the higher the degree of digital inclusion; the higher the degree of digital inclusion, the more mobile young people become.

Thirdly, ICT is not a panacea for the problems of rural and young people in this environment in any of the countries. Decision makers must take into account the fact that only an integrated approach allows a sustainable development of rural areas in the information society: investments not only in education but also in ICT; motivating young people to use ICT; informing the population on how to use ICT safely, etc. At the same time, decision makers must pay attention to the balance between the development of new technologies and the absorption capacity of the labour market: if the modernization of the economy is not accompanied by an increase in the number of decent jobs for young people who are preparing to enter the labour market, then ICT can become a problem and not a solution. The SDGs [9] recommend that both macro and sectoral policies be taken into account so that countries avoid the shocks and crises generated by the transition from one industrial revolution to another. Our data showed that in Bulgaria, Romania, and Turkey, if no action is taken in an integrated manner, positive effect of ICT development is reduced.

Finally, we found that there is a deficit of information about the countries included in the analysis—Bulgaria, Romania, and Turkey—in terms of the situation of young NEETs in rural areas, the level of digital skill development, digital exclusion, etc. Lack of information or incomplete information makes it difficult to intervene in favor of the population and communities. The topic that we have approached needs an in-depth study based on quantitative and qualitative research, which will allow for the collection of data exclusively for the analysis of the relationship between rural areas, digital inclusion, and NEETs. Conducting such studies periodically can be a true support for society and for decision makers.

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