

Investment in Lifelong Learning under the Auspices of Current Turbulent, Dynamic and Challenging Times

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Abstract. *Investment in lifelong learning, with special reference to Economics education is a topic that benefits of a higher interest for academics, business, public and private institutions actively involved within the macroeconomics, mezzoeconomics and microeconomics levels. This topic is included as a key part on the working agenda of international institutions such as: UNESCO, OECD, World Bank, the European Commission. The paper presents briefly an overview of the current state of the scientific literature on the topic by emphasizing the role of human capital development. Within some benchmarking such as DESI (Digital Economic and Social Index) Human Capital is considered to be one of the most important dimensions. The paper highlights the importance of Romania's Human Capital dimension within DESI (Digital Economic and Social Index) as compared to the same dimension of some European countries that had been chosen by taking into account their better ranking on DESI (Digital Economic and Social Index) and correspondingly on their Human Capital dimension. From a methodological point of view, the paper follows successively the main methodology of such a research starting with a synthesis of the state of knowledge based on the investigation of the relevant similar studies identified within the specialised literature, focusing next on a brief analysis of the most important characteristics of the Romanian context.*

Keywords: Investment in lifelong learning, human capital, Digital Economic and Social Index, digital transformation, Economics and financial education, holistic interdisciplinary vision, core competences.

Introduction

The paper promotes a holistic interdisciplinary broader vision of investment in lifelong learning that incorporates a quite new vision that highlights the importance of Wisdom, Talent, Knowledge, Creative and Innovative Management, applied mostly within Learning Knowledge-based Organizations. In a dynamic, turbulent and challenging world, managing diversity by supporting different people interactions requires more and more an important focus on the development of core competences and skills focusing on soft and communications abilities.

The main goal of the paper is to present some new approach regarding investments in education focusing on lifelong learning perspective and mostly on new benchmarking methods that highlight the importance of human capital for development in the context of digitalization based on DESI (Digital Economic and Social Index). Following an analysis of relevant research studies and publications from the scientific literature some research gaps had been identified.

Firstly there is a shortage of research studies that differentiate the impact of investments in Life Long Learning, over an economic and social development long-run strategic vision.

Secondly, the scientific and political discourses that surround the topic of investments in education are centered on public investments neglecting other financial alternatives.

Thirdly, scholars tend to allocate extensive examination to globalization and challenges affecting investing in education such as brain drain without placing too much emphasis on issues such as Talent Management, and mostly to a bottoming-up approach based on glocalisation, exploring the potential of local creative communities who value the potential of creative class, gifted people.

Fourthly, while new benchmarking such as Beyond GDP had been developed there is a quite lack of studies that highlight the contributions of investments in education for a sustainable, competitive, resilient and inclusive development. Based on this relevant research gap identified the authors had formulated clearly their research question in terms of highlighting the role of human capital and mostly investment in lifelong learning for a long-run sustainable, resilient and inclusive development. The main tool is the benchmarking called symbolically DESI (Digital Socio and Economic Index). The paper is just a little part of the first author doctoral research. For this paper we focused on DESI. On previously published papers we had taken into account mostly the set of core competences and of soft skills better designed in the context of the new business model such as to assure a long-run competitive advantage (Suciu et al, 2023)

The paper is structured as follows: first it provides an overview of the current state of the scientific literature on the topic; next it includes a presentation of research methodology; finally it presents the main results and the implications for policy makers by highlighting the contribution brought by the paper to the research field. It includes also conclusions and references.

Literature review

Human capital dimension on the Digital Economy and Society Index

As DESI (Digital Economy and Social Index) illustrates as a quite new alternative benchmarking all the European countries had experienced a progressive dynamics in time but the intensity and speed of growth was not made at the same rhythm (STOICA and, 2017).

Some authors (Bánhidi et al, 2020) analyzed the dynamics of all the dimensions of the Digital Economy and Society Index (DESI), based on 2018 raw data published. This author had identified two ‘independent variables, namely *Connectivity* and *Human Capital*, and correspondingly three ‘dependent variables’, which are the following: *the use of Internet*, *Integration of Digital Technology*, and *Digital Public Services*.

Our paper focus on the dynamics of the *Romania’s Human Capital dimension*. In order to provide also a benchmark tool useful for policy makers we applied a comparative research to the performance registered on the same dimension of DESI, namely Human Capital for some European countries scoring better both on DESI and correspondingly on its Human Capital dimension.

Our research shows how the increase of the performance and ranking on the Human Capital dimension brings correspondingly an increase in the overall performance and ranking based on Digital Economy and Society Index (DESI) for each country

Looking within the literature in order to identify similar research studies and publications we are happy to share the same conclusion in line with other authors. About the progress made by Romania, based on analyzing the indicators provided by the Digital Economy and Society Index, other authors (Stoica and Bogoslov, 2017) had highlighted the role of the digital skills level for

Romanian citizens. These authors illustrated also the importance of Human Capital dimension for facilitating the use of modern technologies and correspondingly by enhancing the increase of productivity and as a result also the economic growth and long-run development.

In line with this approach according to (Organisation for Economic Cooperation and Development, 2018), teachers, school leaders and the managerial team are expected to actively support a continuously innovative process, in favor of the adaptation and development of teaching practices by better equipping students with an appropriate set of core skills, competences and knowledge mostly needed in order to reach success both from a professional and personal point of view, in current daily life but also on the labour market and /or at work, in the case of free landers.

It seems human civilization is on an important turning point during these challenging, turbulent, complex and dynamics times. Thus education is '*poised for its next big step: A data revolution and a radical reimagining of teaching and learning*' (Organization for Economic Cooperation and Development, n.d.)

The study of (Suciu et al., 2023) shows how important are core competences, among which soft skills, communication lifelong learning and leadership are mentioned.

Core competences are one of the most important catalyst that has the potential to enable a sustainable, competitive and resilient transition of business models towards industry 5.0. One of our previous co-authored paper published in *Sustainability Journal* based on our co-operation within a broader cross disciplinary team in 2023, (Suciu et al., 2023, p.8) outlines the role of the human resources, in general and mostly the key significant role of the set of core skills and competences (among which communication and soft skills have a critical playing role today) which '*are considered as one of the most effective and efficient long-run strategic investments on all the levels (microeconomics, mezzoeconomics and macroeconomics.*'

Methodology

The paper follows successively the methodology that is used within this kind of research. It starts with a synthesis of the state of knowledge based on the investigation of the relevant literature, focusing next on an analysis of the most important characteristics according to the Romanian context based mostly on the Human Capital dimension of DESI.

The authors performed a systematic literature review of the most relevant studies, according to the author's view, correspondingly improved by a comparative analysis of various approaches identified within the scientific literature are presented briefly. Thus the authors made references to some previous research similar to the present paper. Then, analysis of the human capital dimension within the Digital Economy and Society Indicator (DESI) is done in order to highlight the role of people's education within the whole societal dimension mostly in the context of a digital world.

All these are considered to be a potential bases for an analysis and development of best practices examples in order to embrace digital transformation and progress within the society, performed based on analysis of best practices introduced so far by other countries.

Results and discussions

The Human Capital dimension of the Digital Economy and Society Index is reflected (2014-2022) by the levels of two sub-index namely: *Human Capital Basic Skills and Internet Use* and correspondingly by the *Advanced skills and Development*.

Human Capital Basic Skills and Internet Use is based on the measuring of the following categories of skills: at least basic digital skills, above basic digital skills and at least basic digital content creation skills (% individuals).

Advanced skills and Development is based on the measuring of the following: ICT specialists (% individuals in employment aged 15-74), Female ICT specialists (% ICT specialists), Enterprises providing ICT training (% enterprises), ICT graduates (% graduates).

According to the last available edition of the published Report regarding the *Digital Economy and Society Index* (DESI) during the years 2019-2022, Romania's ranking for the Human Capital dimension was behind as compared to other European Union countries.

The evolution of the indicators of Romania for Human Capital dimension of DESI, for the time period between 2017-2022 is reflected in Figure 1.

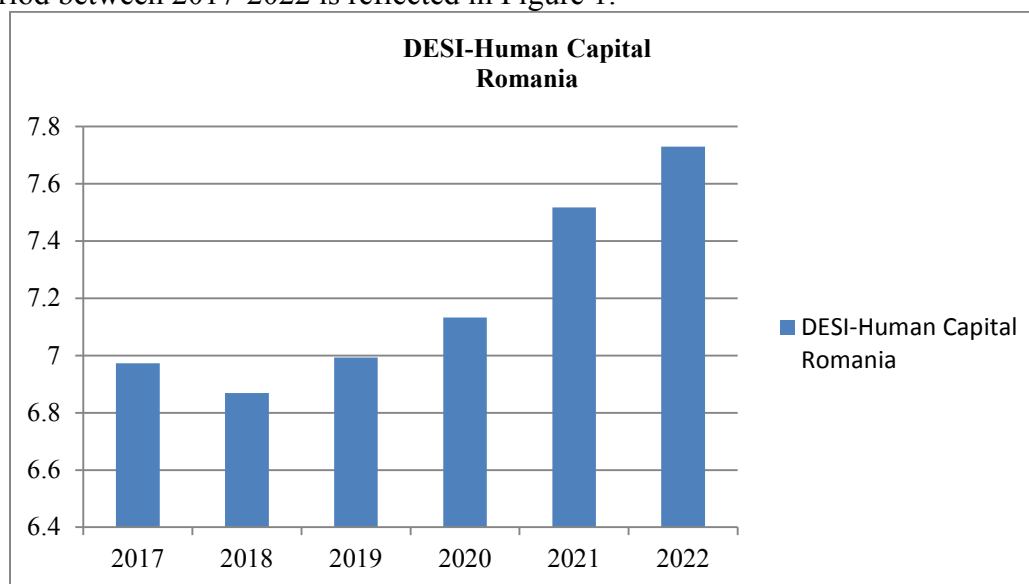


Figure 1. The evolution of the Human Capital dimension during 2017-2022

Source: designed by authors based on data published within DESI Report by the European Commission.

Note: On the horizontal axis it is illustrated the year while on the vertical axis reflects the weighted score of Human Capital, within Digital Economy and Society Index (DESI)

The dynamics of the human capital dimension from DESI shows an improvement since 2017 until 2022, except for the year 2018 when it shows a decrease, as compared to the previous year 2017. However, we consider there is still room for improvement for Romania and this represents a priority for the next period of time. This is why we were looking for a comparison with the countries that had recorded better performances in terms of DESI index and their corresponding ranking both in terms of DESI and Human Capital.

We consider that, in order to facilitate a sustainable, competitive and resilient future for the digital economy and society, national and international policies should go far beyond the ranking of countries that have users and consumers of the digital economy.

Hence, we highlight the important and accelerated role of education and lifelong investment in education aimed at facilitating the formation and development of national capabilities for the creation and preservation and even increasing during a longer period of time of the value brought by it (UNCTAD United Nations, 2019).

The need of financial education was highly illustrated previously over time by many scientific papers and reports. Now, considering the digital transformation and digital economy

main characteristics, one may conclude –based on analysis of the human capital dimension reflected by *Digital Economy and Society Index* that digital financial education is also more and more needed since ITC (Information Technologies and Communications), AI (Artificial Intelligence) and AR (Augmented Reality), Big Data, Cloud development highly impact the financial sector of activity.

Starting from 2023, the cardinal points defined (European Commission, n.d.) by the so called *Digital Decade Report 2023* cover four areas, identified as to be essential for the digital transformation of the European Union, namely: *Digital skills; Digital infrastructures; Digitalisation of businesses; Digitalisation of public services.*

The Digital Decade policy program (European Commission, n.d.) is setting clear targets and objectives for 2030 such as: *Basic Digital Skills*: 80% of population and correspondingly *ICT specialists*: minimum 20 million.

In terms of *Digital transformation of businesses* (European Commission, n.d.) the targets are 75% of EU companies using Cloud, Artificial Intelligence, or Big Data. It is even a grow scale-ups & finance according to which more than 90% of SMEs reach at least a basic level of digital intensity.

From the perspective of the comparability of the I-DESI index published for 2020, as a result of the data analysis for four years studied, namely 2015 – 2018, the EU27 member states occupied five of the first ten positions of the I-DESI index of 45 countries.

Finland ranks first among EU countries; the first non-EU country, which took a third of all 45 countries analyzed, was Iceland, followed by Denmark (European Commission, 2020)

From the perspective of the comparability of the I-DESI index published for 2020, as a result of the data analysis for four years studied, namely 2015 – 2018, the EU 27 member states occupied five of the first ten positions of the I-DESI index of 45 countries. Finland ranks first among EU countries. (European Commission, 2020)

The analysis shows that European countries are leaders in digital development.

Based on the McKinsey's Study (McKinsey, 2018), in which a global examination of trends is carried out, there is no standard way to achieve high digitization rates. Most markets, including digital frontrunners, have digitized unevenly, with wide variations between different sectors and individual companies.

European initiatives could be based on four economic and societal objectives (European Commission, 2020) that benefit from digital technologies and support their development and adoption. These refer to: building and implementing digital solutions for societal challenges; reinvigorating democracy, trust and cultural diversity; ensuring digital technological sovereignty and cyber security; increasing Europe's competitiveness. Digitization is considered as an important opportunity for European industries to create the next generation of innovative products and services, to preserve jobs and create new ones.

Based on a Study (Pan W., 2022) performed on the Chinese economy, digital economy acts as an innovation driver for the extensive and sustainable development of the total factor productivity (TFP).

However statistical data illustrate there is a regional diversity that digital integration in eastern China accelerates the high-quality the total factor productivity growth, while they are relatively inferior in the central and western regions. The results aimed at being used to for identifying the regional barriers existing in ITC, launch a cooperative program, and construct a decentralized infrastructure.

Comparing the level of the above the basic digital skills (age 16-74) in 2023 for Romania, as compared to the other European countries, Romania is before the last of the European countries, meaning scoring as the 27-th out of the 28 European countries. This may not come as a surprise factor, judging by the monitored sources revealing the low progress for Romania not only in terms of the level of acquiring of the digital skills but also for the aggregate indicator Digital Economy and Society Index, where Romania scored low for the last decade.

However, one may note that Romania scores in 2023 as the 5-th European countries in terms of ICT graduates, 6.9% well above 4.2% which is the level of the medium of European Union for ICT graduates in 2023, as revealed by (European Commission, 2024).

The results reveal the fact that Romania has some improvements to make for following the general trend set by the European Commission by several policies focused on the digital and to the author's opinion, integration of new technologies, digital transformation and digital education are some of the important factors to promote an increase of the Digital Economy and Society Index.

The Organization for Economic Co-operation and Development (OECD) pointed out and the authors highly agree that Romania needs to focus on creating new jobs and improving the quality of life for all jobs and skills development and on providing access to high-quality education (National Financial Education Strategy 2024-2030, 2024).

Romania's Case as compared to some other European countries

As already pointed out, the human capital dimension of the Digital Economy and Society Index, Romania showed improvement for the last years but it still below the level of the European Union, as showed in Figure 2 where a comparison between Romanian's indicators and those of European Union for the years 2019-2022 is presented. On the horizontal Axes (OX) it is illustrated the year – for Romania and for the European Union - while on the vertical Axes (OY) reflects the weighted score of Human Capital, within Digital Economy and Society.

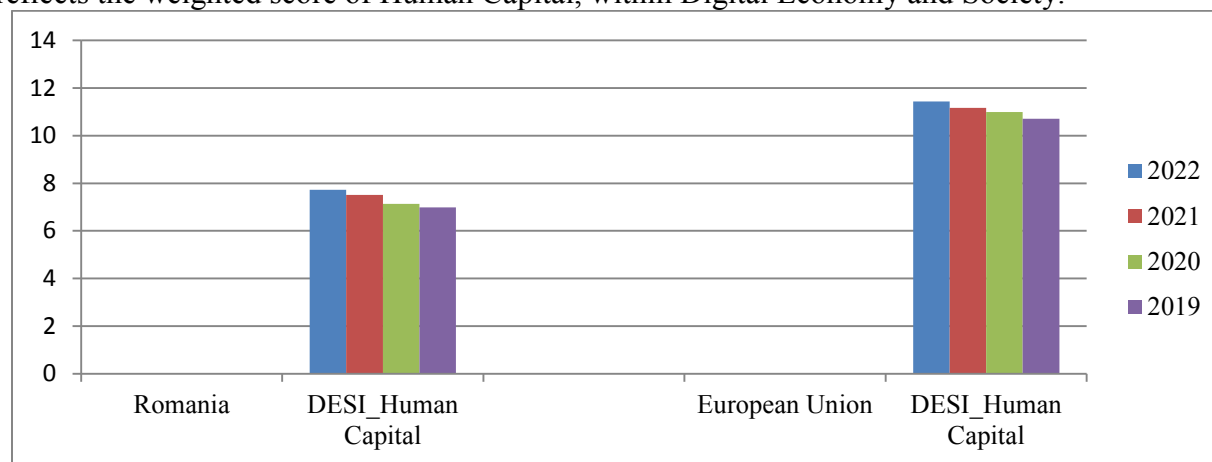


Figure 2. The evolution of the Human Capital dimension in Romania and EU countries during 2019-2022

Source: designed by authors based on data published within DESI Report by the European Commission.

By analysing the indicators of the European countries which are at the top of the list from the Digital Economy and Society Index' perspective, the level of their human capital indicators are above the level of those reported for Romania. Results are presented in Figure 3. On the horizontal Axe (OX) reflects the year – for Romania and for other European Union countries:

Slovakia, Luxembourg, Denmark, Sweden, Netherlands, Ireland, Finland - while the vertical axes (OY) reflects the weighted score of Human Capital, within Digital Economy and Society Index (DESI).

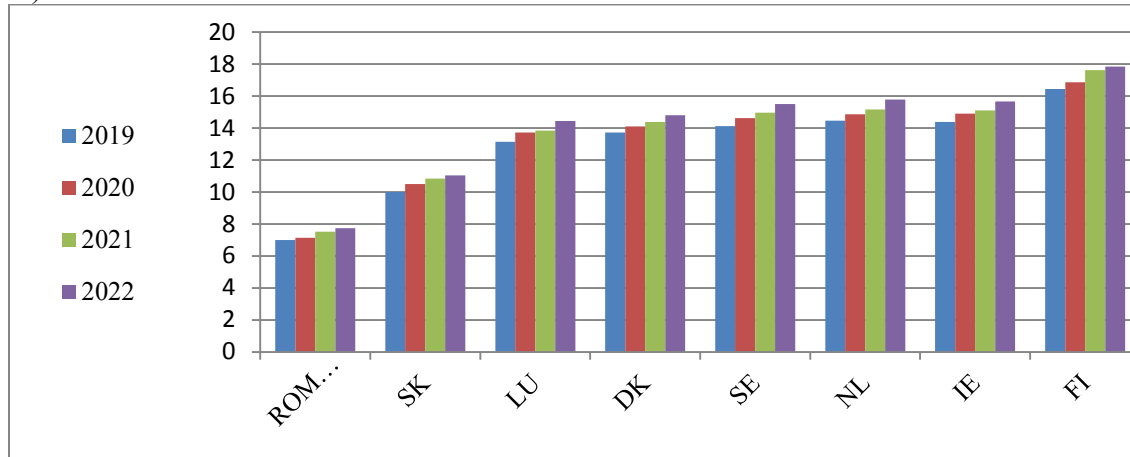


Figure 3 DESI Human Capital for Romania as compared to other European countries 2019-2022

Source: designed by authors based on data published within DESI Report by the European Commission.

By investigating how the Human Capital dimension influenced the overall performance in terms of digitalisation, as showed by the Digital Economy and Society Index (DESI), the authors performed an analysis based on a Spearman non-parametrical ranking correlation, between the ranking of the Human Capital and the overall performance reflected by composite Digital Economy and Society Index, taking into account the countries that are ranked as top performers.

Data for Romania, Slovakia, Luxembourg, Denmark, Estonia, Netherlands, Ireland and Finland for the Human Capital dimension and for the overall Digital Economy and Society Index were extracted and processed by the author for the years 2019-2022 and presented in Table 1.

Table 1 Data for the Human Capital dimension and for the overall Digital Economy and Society Index for 2019-2022

DESI (composite)								
Year	RO	SK	LU	DK	SE	NL	IE	FI
2019	22.37	33.25	47.73	52.05	51.96	50.52	46.70	54.14
2020	24.73	36.19	51.20	55.97	55.75	54.68	50.81	58.43
2021	27.43	39.95	55.04	65.25	60.49	62.36	57.11	63.16
2022	30.58	43.45	58.85	69.33	65.22	67.37	62.74	69.60
DESI_HC (weighted score)								
Year	RO	SK	LU	DK	SE	NL	IE	FI
2019	6.99	10.00	13.15	13.72	14.12	14.46	14.39	16.44
2020	7.13	10.49	13.72	14.09	14.62	14.85	14.91	16.87
2021	7.52	10.83	13.84	14.39	14.97	15.16	15.11	17.63
2022	7.73	11.03	14.44	14.80	15.49	15.78	15.66	17.85

Source: Authors' own research based on Dataset published under Digital Strategy (European Commission, n.d.).

The analysis based on a Spearman non-parametrical ranking correlation, taking into account the countries that are ranked as top performers is presented in Table 2.

Table 2 Spearman non-parametrical ranking correlation between the Human Capital dimension and the overall Digital Economy and Society Index for 2019-2022

Year	2019	2020	2021	2022
Coefficient (Rs)	0.71428571	0.666667	0.738095	0.833333
N	8	8	8	8
T statistic	2.5	2.19089	2.679659	3.692745
DF:	6	6	6	6
p value:	0.04652823	0.070988	0.036553	0.010176

Source: Authors' own research. based on Dataset published under Digital Strategy (European Commission, n.d.).

Note: Coefficient R stands for the coefficient correlation value, N means number of pairs, DF means Degree of freedom, p value shows the confidence intervals for Spearman's correlation

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The analysis shows the importance of the Human Capital dimension within the overall Digital Economy and Society Index, reflected by the analysed coefficients.

There is a positive correlation between the ranking of the Human Capital and the overall Digital Economy and Society Index, reflected by the coefficient correlation value Rs for all data related to the four analysed years.

The 'p' values obtained for the years 2019, 2021 and 2022, after a two- tailed distribution test, are less than 0.05 and this shows that there is a significant positive correlation between the ranks of the Human Capital and the overall performance of the countries examined and for the year 2020, the result shows a positive correlation, the value being between 0.5 and 1.

All the countries which managed to rank high, based on the analysis of Digital Economy and Society Index, had also high ranking scores for the Human Capital dimension.

Therefore the Human Capital component is significant for the overall evolution of each country in terms of digitalisation, as measured by the Digital Economy and Society Index.

As mentioned before, starting 2023, the indicators summarising Europe's performance across the four dimensions: digital skills, digital infrastructure, digitalisation of business and digitalisation of public services which are incorporated by the Digital Decade policy programme (European Commission, n.d.)

Conclusion

As a main conclusion and contribution of the paper, this work highlights and discuss the importance of the human capital and mostly of Lifelong Learning for a long-run, sustainable inclusive and resilient development based on the Human Capital dimension of DESI.

The authors strongly believe that new educational programs should be adapted to the provocative digital era and to the new challenges that we might experience based on the anticipated evolution of professions involving digital skills and operating with digital infrastructure and processes, cyber threats dealing with and risk management. Thus, we strongly believe that Lifelong Learning investment in education have to support mostly people facing the disruptive challenges of the current turbulent, complex and dynamic context.

In terms of the main results our paper shows how the increase of Human Capital dimension highly contributes to an increase in the overall performance of DESI (Digital Economic and Social Index).

In line with the contribution brought by the paper to the field of study, we consider that mostly under the auspices of the current turbulent, dynamics and more complex times challenging more and more the socio and economic long-run sustainable, resilient and inclusive development investment in lifelong learning is and becomes a key topic.

The education is a major milestone for the modern business environment and the paper emphasizes the role and impact of education on the business performance. This topic is important for academics, business, public, private institutions, at all levels within the economy (macroeconomics, mezzoeconomics and microeconomics levels).

We realize there are limits of our research and thus we intend to further extend the research by taking into account more key factors influencing lifelong learning investment in education.

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