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E-government, digitalization, and environmental sustainability. A theoretical overview, focused on the Romanian national profile

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Abstract: *In the last 30 years, the internet revolution has seized all areas of life, being undoubtedly one of the most important innovations of the century. At the same time, digitalization and e-government slowly followed the lead, significantly impacting the way citizens, businesses, and public administrations interact. However, now that all agents have integrated the new technologies into the socio-economic structures, the mere study of the two concepts individually will not be enough, considering the complexity of the current times and the challenges of the future. Therefore, the current paper aims to introduce a new element in the picture, namely environmental sustainability, as the practice meant to limit global warming and ensure healthy conditions of life. In this sense, we will start to illustrate the theoretical relationship between e-government, digitalization, and sustainability, with a focus on describing the Romanian administrative reality. Consequently, the subject will be split into two sections, first by looking at the related literature for*

an explorative approach, and then proceeding to examine the national case study. In the second part, we will start by defining Romania's e-government status quo, in comparison to the other EU member states, while also showcasing what has been done and what is pending in the next years. Lastly, we will explore some sustainability implications visible at a national level, introducing new digitalization vectors such as NGOs. Having in mind the approach presented, the subject at hand can be considered relevant for the current public agenda, while the methodology employed will help fill in the gap in terms of e-government and sustainability connections, especially in correlation with Romania's reality.

***Keywords**:* e-government, digitalization, environmental sustainability, Romania, literature review

JEL: Q56, O38, D73

1. Introduction

In the last 30 years, entire flows and processes have undergone fundamental changes as a result of the Internet emergence. Starting from the industrial sector, going into private life, and then to the political-administrative systems, technology has altered the way we construct any socio-economic structure. Therefore, although it might not be the first effect that comes to mind in terms of the innovations brought by the internet phenomena, e-government will be a revolution on its own, aiming to replace, or at least improve the conventional bureaucracy systems. Thus, the goal of e-government, under the umbrella of digitalization, will be to provide citizens with higher-quality public services that can facilitate communication and improve the overall level of interaction with different audiences. More than that, considering the recent focus put on environmental protection and sustainability, e-government is gaining a new valence, since it has the potential to become a building block in the new sustainable, inclusive, and circular economy.

Therefore, the current paper aims to connect the concepts of e-government, digitalization, and environmental sustainability and analyze them in the broad context of the 4th industrial revolution. In terms of methodology, the first section of the study will showcase a summary of theoretical approaches and insights found in the related literature, with a focus on e-government. Secondly, we will construct a Romanian e-government profile, starting with a short historical overview and then proceeding with the illustration of the current solutions implemented. To complete the status quo, we will then present the future or work-in-progress solutions in terms of digitalization, while also showcasing the importance of NGOs in the broad Romanian context. As a last step, we will explore some examples where the three concepts could be found together, drawing an initial picture in terms of their synergy and aggregated potential.

At the same time, it's important to make one last methodological mention. Throughout the exploration of the related research, we have observed a prevalence of defining sustainability as part of the development axis, frequently linked with the Sustainable Development Goals designed by the United Nations. However, in this paper, our objective will be to highlight the environmental direction of sustainability, in this way, focusing our attention on the ecological and natural impact. We consider this to be a valuable contribution to the general field, as well as a point of differentiation.

2. Literature review

As seen more and more recently, international cooperation institutions have started to understand the importance of linking digitalization, e-government, and environmental sustainability, designing strategies in an aggregated manner, and enhancing each other's potential. In this regard, perhaps the most important example will be the newest growth model elaborated by the European Union in 2022, namely Towards a green, digital, and resilient economy (European Commission, 2022). This model proposes a transition to a more sustainable, digitalized, and shock-resilient system, that aims to decarbonize the economy, reduce greenhouse gas emissions, increase the use of renewable energy, and ultimately reach the greenhouse emissions neutral goal by 2050.

However, in terms of digitalization, there will be multiple action plans designed to strategically tackle the future directions. One of the most important will be The Digital Europe Programme (European Commission, 2021a), an agenda designed to sustain projects in five crucial areas: supercomputing, artificial intelligence, cybersecurity, advanced digital skills, and ensuring the use of digital technologies across the economy and society. As mentioned also in the official presentation, the action plan is meant to support the twin EU objectives of both a green transition and digital transformation, illustrating the high correlation between the two. Another important European strategy will be The 2030 Digital Compass: the European Way for a Digital Decade (European Commission, 2021b), which will describe the four main vectors of a digital EU: a digitally literate population and highly skilled digital professionals, a sustainable, secure and efficient digital infrastructure, the digital transformation of businesses, and the digitization of public services. In correlation with the sustainability agenda, the action plan will emphasize the importance of building digitalization solutions that have a smaller environmental footprint, are energy efficient, and use resources productively.

Thus, it is getting more and more clear that the way forward is to design a framework in which digitalization, e-government, and green technologies are complementary. However, it's important to highlight that there will be no clear lines between the three concepts, either from a theoretical or practical perspective, so to assess their relationship we will first look at the main e-government effects and then extrapolate some important sustainability implications, in a broader context. Moreover, we will split these effects into two categories: macroeconomic and social.

2.1. Macroeconomic e-government impact

In terms of the first category, we can start with Fritz Machlup, one of the first theorists to identify the economic effects of the information society, with broad applicability to e-government. According to him, information and communication technologies will involve the transfer of funds and money resources, ensuring constant financial and monetary flows (Machlup, 1983). From this perspective, the most impactful effect brought by technology will be absorbed by the tax systems since one of the first goals and functionalities presented by e-government will be tax collection growth. The principle behind this is simple: by having a complementary method of payment that is less costly in terms of time, citizens will have an extra incentive to pay their tax

obligations, thus increasing revenues to the state budget. This can lead to multiple sustainability implications, mostly under the umbrella of reallocation of tax revenue to projects that can build a greener infrastructure, promote better education in the direction of sustainability, implement better waste management systems, or integrate green taxation schemes that can create and model new consumer behaviors.

Another macroeconomic impact of e-government solutions will be the reduction of costs and the correlated savings and budget revenues. A significant part of this reduction will be generated by lowering the administrative procedures costs and building economies of scale. This will be possible by first, replacing the traditional bureaucratic services that consumed substantial resources, and then by lowering maintenance costs and removing low-productivity links. At the same time, as demonstrated also by (Castro & Lopes, 2022), e-government will stimulate sustainable development, evaluated through the adjusting net savings.

Further on, cost reduction will be equivalent to providing better control of government expenditure through the implementation of integrated financial management systems (Bhatnagar, 2003). Highly correlated, several sustainability advantages can be extrapolated, such as reduced paper use, improved data management systems, or the potential to build energy-effective institutions and procure sustainable electronic services and solutions. To confirm that, (Lee, 2017) has elaborated an extensive literature review on the relationship between e-government and environmental sustainability, summarizing the same macroeconomic effects. Finally, e-governance systems can prove beneficial in the mitigation and management of disaster risks, with a clear cost-reduction perspective being valid (UN News, 2008).

Lastly, since we are discussing macroeconomic effects, it's important to also highlight the impact of e-government on the private sector. Therefore, through building a hardware and software national infrastructure, the motivation to invest in a business environment that is supported by a high degree of digitalization is rising considerably. Thus, private companies will be incentivized to build new headquarters and increase the flow of money in the national economy. Consequently, much like a domino effect, the connection between sustainability and digitalization will be the most evident. Several sustainability advantages can be emphasized, starting from the high innovation platforms that the private sector develops and the shared interest in allocating and using resources more efficiently. Moreover, the investments that are allocated by businesses in the green or circular industries can prove to be decisive in the overall transition to a new growth model, so the priority of the national administration should be to facilitate as much as it can the state-company interactions.

2.2. Social e-government impact

Going forward into another category, namely the social effects, an important aspect that e-government yields is the decision-making and public agenda designing. Digitalization can enhance both, offering increased transparency, interoperability, and the prevention of abuse or corruption. In this sense, there will be many instruments, as well as best practices that can be used, starting from the online public consultations, open data portals, and the adjacent visualization

tools, the public institutions' websites, or the digital feedback mechanisms. Finally, by building a more digital public landscape, sustainable policies, regulations, and practices can be proposed, voted on, or implemented, thus helping the transition towards the new green economy model.

Remaining in the societal effects category, as with any other technology and innovation, the labor market is bound to be impacted. Regarding digitalization, the consequences could be perceived as both positive and negative, since there will be new skills that need to be developed, as well as acknowledge the endangerment of some job descriptions. However, the role of the state in this discussion will be crucial since the entire paradigm can be switched to people's advantage if implemented properly. For example, through building e-government solutions, the changes in the skills required for data processing will not only energize the workforce but also integrate new jobs in the administrative apparatus, forced to keep up with the private sector environment. Therefore, the occupational reorientation will either keep constant or increase the number of white-collar workers, while also reaching the goal of bureaucratization minimization (Machlup, 1983).

In terms of how the re-education process will impact the sustainability agenda, it's important to mention that the new proposed economic framework has as a priority to ensure inclusivity and stimulate the job creation, with green energy being a main pillar for that goal. However, this remains to be seen, and the future of work, especially in the administrative sector and the interaction with citizens, could be threatened by the technologies designed to automate manual processes (Arntz, Gregory & Zierahn, 2019). Hence, it will be crucial to prepare and integrate professionals with high digital skills, since they will be more eager to adapt to new job opportunities, overlooking the risks of transition from their current positions or responsibilities.

Lastly, to sum up the aspects previously described, in Table 1 we have designed a schema that starts from the advantages of digitalization and then extrapolates some environmental sustainability implications.

Table 1. Digitalization (e-government) advantages and the sustainability implications

CATEGORY	ADVANTAGES	SUSTAINABILITY IMPLICATION
MACRO-ECONOMIC EFFECTS	Increased tax collection	Tax revenues can be used to finance sustainable projects and solutions around green energy and the adjacent sectors.
	Stimulation of the private sector and the flow of investments	Private companies can significantly enhance sustainability by driving innovation, designing business models based on resource optimization and efficiency, adapting, and promoting circular economy practices, and investing in renewable and green energy industries.
	Cost efficiency, budget and energy savings, and resource optimization	E-government can help improve bureaucracy, with immediate effects: reducing paper use, improving data management, and building a long-standing low-maintenance cost infrastructure.
SOCIAL EFFECTS	Job creation and skills development	Prepare new generations of professionals, with high digital skills that can easily adapt to the new green and sustainable areas of work.
	Improved decision-making and public agenda designing	Promote, vote, and implement sustainability policies, regulations, and practices in a more fast, easy-to-follow way.

Source: Authors' own research

We can see that through the aspects previously described, we have focused more on the opportunities created by digitalization and e-government in the fight against climate change and the ambitious goals set up in terms of pollution and gas emissions. However, it's important to note that there will be some negative implications that digitalization undoubtedly brings to the table, in a reverse relationship. The most evident will be the environmental cost of building a complex infrastructure since it will employ high levels of energy consumption and electronic device waste. Therefore, as emphasized multiple times by the European Commission, in the transition to the new growth model, it will be crucial to design regulatory measures to reduce the environmental footprint of data centers and communication networks, while also reducing the amount of ICT products disposed.

3. Romanian e-government profile

3.1. Status quo and historical overview

Going now to the second part of our paper, as a starting point in this discussion, it's useful to define Romania's status quo, especially compared to other European Union states. One method of evaluation can be represented by the European Digital Economy and Society Index, an instrument used to track the performance of the EU's digital competitiveness. Therefore, in the last report, namely (DESI, 2022), Romania was ranked last in terms of digital transformation, not

converging with the rest of the EU member states. The report will explain that although Romania managed to attract significant investments in the last years, mainly through the high-speed and capacity server network (connectivity direction), it is still lagging in terms of human capital, digital public services (e-government), and overall integration of digital technologies.

Thus, the slow digital transition can present a domino effect, impacting the progress toward a sustainable and modern economy. However, there will be some good signs that Romania can accelerate the transition, since in 2022, for the DESI sub-indicator named ICT for environmental sustainability the registered value was 68%, two points over the average European level – 66% (DESI, 2022). This indicator is designed to measure the share of enterprises that are having medium or high-intensity green actions through ICT, and the good results registered at a national level demonstrate that Romania's private sector is interested in this new socio-economic framework. At the same time, the performance confirms one important theoretical link between sustainability and digitalization, namely the bidirectional stimulation of the private sector.

Going forward in the construction of the national profile, although Romania's progress remains modest in comparison to the other European Union member states, several e-government systems have been developed and pushed forward by the authorities, gaining more popularity as we speak. To understand the evolution of those, we will quickly look through a historical overview. Therefore, the first relevant legislation applied to the information society was adopted in 2001, namely, the 544/2001 Law on free access to information of public interest. At that moment, the legislation was describing for the first time the electronic transmission of information.

In practical terms, however, one of the first national implementations was happening in 2003, when the National Electronic System (SEN) was set up as part of the anti-corruption package to ensure the transparency and good functioning of public responsibilities. Currently, it will be synonymous with e-guvernare.ro portal and will provide access for citizens, companies, and government agencies to the main points of contact in terms of digital administrative services and procedures. At the same time, e-guvernare.ro will be Romania's node in the Single Digital Gateway (European Commission, 2018), the interactive network of the European Union designed to offer easy access to information, procedures, and assistance in issues management. The system is under the responsibility of the Romanian Digital Authority (ADR), an institution created in 2020, with the broad objective of turning digitalization into reality, as part of the current Research, Innovation and Digitization Ministry. Therefore, in terms of its goals and instruments, ADR is implementing new e-government solutions that aim to enhance the national administration through concepts such as interoperability, electronic identity, and governmental cloud.

Since the 2000's many e-government solutions have been developed, implemented, and connected, all of them being easily accessible through the e-guvernare.ro or ADR (adr.gov.ro) website. For example, we can mention the launch of the e-Licitatie system in 2004, operational since 2006, now called the Electronic Public Procurement System (SEAP). The solution was designed to improve the transparency and control of public procurement, becoming now a best-practice case, internationally recognized. In terms of some other solutions, we can name aici.gov.ro, an intermediary portal for the registration of documents addressed to public institutions that do not have their platform, the national catalog of public services, or the Single Electronic Point of Contact.

Therefore, to sum up and build the entire picture, in Table 2 we have illustrated the most important e-government and digitalization systems, which are currently active, along with some statistics in terms of use and operation in December 2023.

Table 2. Main e-government services in Romania, December 2023

E-GOVERNMENT SOLUTION	OBJECTIVES	STATISTICS
E-GOVERNMENT PORTAL (NATIONAL ELECTRONIC SYSTEM) https://e-guvernare.ro/	The official portal for e-government services, designed for citizens, businesses, and government agencies. Connects Romanian administration to the European network Single Digital Gateway (SDG).	8.363 institutions
VIRTUAL PAYMENT WINDOW https://www.ghiseul.ro/ghiseul/public/	Online card payment of taxes and fees to the public institutions enrolled.	1.897.265 users
ELECTRONIC PUBLIC PROCUREMENT SYSTEM (SEAP) https://www.e-licitatie.ro/pub	Electronic procurement of goods and services necessary for public authorities.	231.898 SEAP entitites
TRANSPORT LICENCES PORTAL (SIAE) https://www.autorizatiiauto.ro/Portal	Electronic allocation of international road authorizations and national routes in the transport programs.	1.802.168 licenses
SINGLE ELECTRONIC CONTACT POINT https://edirect.e-guvernare.ro/	Connecting central and local government and other competent authorities to obtain the necessary authorizations for service activities.	5.817 procedures
AICI.GOV.RO https://www.aici.gov.ro/home	An intermediary platform for registering documents addressed to public institutions that do not have their online registration system.	608.907 Users
ROeID https://roeid.ro/	ROeID is Romania's Single Sign On (SSO) solution, through which citizens will be able to use a single username and password for all state IT platforms.	

Source: Authors' own research

3.2. Current and future projects

Regarding the future, there are several projects that Romania is working on to improve the e-government level. These projects aim to provide more efficient data management, to stimulate the private sector and the citizen's public activity, while also connecting the national system to the European Union network. At the same time, in Romania's Recovery and Resilience Plan (RRP, 2021), one of the main national objectives is to address digital shortcomings, with a significant 1.82 million euros being allocated for this goal. As stated in the agenda, the digital transformation of the public sector, cybersecurity, and connectivity, are only some of the aspects that will be in focus in the next five to ten years.

As a result, in Table 3 we can see the work-in-progress e-government solutions, which are currently being implemented by the ADR and other administrative institutions. We have categorized them into three classes: financial, social, and strategic. Some important processes regarding life events will be improved, such as adoption, disability, and several health systems. At the same time, in 2024, multiple financial solutions will be implemented, that aim to improve the interaction with the private sector. Examples in this category are the long-awaited e-invoice system or the e-VAT. Lastly, a couple of strategic solutions will be implemented soon, with a connectivity objective.

Table 3. Main e-government services to be implemented in Romania

AREA	E-GOVERNMENT SOLUTION	OBJECTIVES
FINANCIAL	INFORMATION SYSTEMS OF NATIONAL STRATEGIC INTEREST (SIISN)	• **National e-Invoice system** for electronic invoicing • **National RO e-Transport** system for monitoring road transport of goods with high fiscal risk. • **National RO e-Seal** system for electronic sealing of goods. • **e-SAF-T** system for the standard fiscal control file. • **National RO e-Cash** register system for the national register of electronic fiscal cash registers. • **National e-VAT** Information System RO for pre-filling information on taxable operations in VAT statements.
SOCIAL	NATIONAL INFORMATION ADOPTION SYSTEM (ANPDCA)	Implementation of an adoption portal designed to integrate the necessary administrative processes, such as the electronic child file, the post-adoption monitoring, and the interoperability of all institutions involved.
	NATIONAL MANAGEMENT SYSTEM FOR DISABILITY (ANPDPD)	Develop and implement a centralized national platform for collecting, storing, and distributing information on people with disabilities (adults and children) to central and local public authorities, individual beneficiaries, and institutional partners.
	NATIONAL HEALTH INFORMATIC SYSTEM (REGINTERMED) THE INFORMATION SYSTEM FOR CLINICAL RECORD OF INTENSIVE THERAPY SECTIONS (SIEC – ATI)	Implementation of health registers and their interconnection with other e-health IT platforms. Progressive updating of information according to health information needs - diagnosis, treatment, evolution, and decision-making in emergencies. The implementation of a modern IT system for monitoring, documentation, and exchange of medical data related to anesthesia and intensive care activities (ATI), which will function as a decision support system in a central unit of the Ministry of Health.
STRATEGIC	INTEGRATED SYSTEM FOR A PERFORMANT INFORMATION SOCIETY (SIMSIP)	Increase the administrative capacity of ADR to support institutional reforms through the implementation of a unified quality, and performance management system.
	TECHNOLOGICAL INTEROPERABILITY SYSTEM WITH EU MEMBER STATES (SITUE)	The construction of the eIDAS node for Romania will interconnect it with the eIDAS nodes of the other Member States and the identity and electronic services providers in Romania.

Source: Authors' own research

3.3. Sustainability implications

Finally, we have seen how the e-government and digitalization profile of Romania is developing at an accelerated pace, in this process generating positive and negative sustainability effects. Although we couldn't find any available numbers regarding a quantitative sustainable impact, we will identify several projects or areas in which e-government, digitalization, and sustainability work together. For example, the integration of smart cities and urban mobility (Mihaila, 2018), intelligent agriculture, and waste management enhancements are some ongoing solutions that are currently carried out all over Romania. Another is presented by the transport system, with 864 million euros being allocated in the next years for railway digitalization and the development of sustainable road infrastructure (DESI, 2022).

At the same time, we need to mention that Romania has ambitious targets in terms of energy reconfiguration, stimulated by the potential it has when it comes to wind, solar, or hydroelectric energy projects. In this sense, a brand-new initiative was presented at the end of December 2023, by the Oil and Gas Employers' Federation in partnership with the Employers' Association of Women Entrepreneurs. The project entitled #ITforENERGY aims to improve the level of digital skills of 320 employees who carry out their main activity in less developed regions, mainly in the energy and environmental management sectors, to adapt their activity to the dynamics of the economic sectors. We can therefore see how another theoretical insight was confirmed, namely the strong correlation between sustainability, the private sector, and the digital skills of the future.

However, besides the national administration and the business sector, it's important to mention that Romania's civil society has also become more and more active in the implementation of digitalization and sustainability objectives. Consequently, we have multiple non-governmental organizations which are developing solutions to improve interactions between citizens, while also promoting projects in the energy and environmental protection field. From this list, we could name Greenpeace Romania, Green Revolution, TechSoup Romania, or Tech Lounge. However, in terms of the synergy between the three concepts, there is an NGO that can be considered representative: Code for Romania, an independent, non-partisan, and non-political organization. The main vision behind all the digital solutions proposed by the NGO will be based on 5 highways: education, care, health, participation, and environment for Romania. Thus, in the last category, we can pinpoint several solutions (and objectives) that have a clear sustainable effect: healthy and protected forests, pollution measurement, recycling and waste management, friendly cities, or natural disaster and earthquake prevention. All of these are work-in-progress, designed and implemented by volunteers who believe in the potential to redesign a more sustainable community, through digitalization.

Therefore, regardless of the main agent of change, the public, private, or civil sector, digitalization, and e-government can help build technologies that are cheaper in the long run, more efficient, and personalized to the national profile. As mentioned in the Digital Reset Report (D4S, 2022), a clear vision for digital technologies is indispensable to addressing social and environmental challenges successfully. This can be done by having agile governance institutions, in which the social-economic goals are redesigned to integrate positive sufficiency, circularity, and sustainability effects.

4. Conclusions

As seen throughout the literature review section, one of the crucial elements that will minimize vulnerabilities and accelerate progress will be prioritizing e-government and digitalization as a sustainable development pillar. Following the European Union strategies, the redesign of the economic framework needs to rely on the green energy transition and the inclusive modernization of government interactions. Therefore, the concepts proposed undoubtedly show a high correlation, both from a theoretical and practical perspective, since they have the potential to stimulate the private sector, reconfigure the skills of the future, enhance tax collection, and reduce

administrative costs. Thus, the focus should be put on the medium and long-term gains, since on the immediate horizon, the investments necessary to achieve the reconstruction could have a high impact on the general rentability.

Moreover, regarding Romania's digital profile, the first steps in this direction have already been made, with several solutions being implemented by both the national administration and the civil society. At the same time, what was lacking in the last decade, namely the full-prioritization of e-government and digitalization has now been tackled and pushed forward by the pandemic context, with multiple solutions being expected in the next couple of years.

Having all these in mind, we consider that the case study put forward represents a good starting point in understanding where Romania is heading in this domain, especially in correlation with the European Union's actions. The synchronization pace will also be crucial since it will make the difference between the states that are highly adaptive and have understood the new, modern paradigm, and the ones that are still struggling to make the transition. What is certain is the fact that the ability to build complex, feasible, and sustainable systems will be the way forward in achieving socio-economic development, while also minimizing the multiple health and climate risks that humanity is facing.

REFERENCES:

1. Arntz, M., Gregory, T., & Zierahn, U. (2019). Digitization and the future of work: macroeconomic consequences. In Handbook of labor, human resources and population economics (pp. 1-29). Cham: Springer International Publishing.
2. Bhatnagar, S. (2003). E-government and access to information. Global Corruption Report 2003. Washington DC: Transparency International, London: Profile Books, pag. 24-32.
3. Castro, C., & Lopes, C. (2022). Digital government and sustainable development. Journal of the Knowledge Economy, 13(2), 880-903.
4. DESI – The Digital Economy and Society Index (2022). Published at: [https://digital-strategy.ec.europa.eu/en/policies/desi-romania], last accessed on December, 2023.
5. Digitalization for Sustainability (D4S), 2022: Digital Reset. Redirecting Technologies for the Deep Sustainability Transformation. Berlin: TU Berlin. Published at: [https://doi.org/10.14279/depositonce-16187.2.], last accessed on December, 2023.
6. European Commission (2018). Single Digital Gateway (2018). Published at: [https://www.un.org/en/desa/expert-group-meeting-e-government-sustainable-development], last accessed on December, 2023.
7. European Commission (2021). The Digital Europe Programme. Published at: [https://commission.europa.eu/funding-tenders/find-funding/eu-funding-programmes/digital-europe-programme_en], last accessed on December, 2023.
8. European Commission (2021). 2030 Digital Compass: the European way for the Digital Decade. Published at: [https://eufordigital.eu/wp-content/uploads/2021/03/2030-Digital-Compass-the-European-way-for-the-Digital-Decade.pdf], last accessed on December, 2023.
9. European Commission (2022). Towards a green, digital and resilient economy: our European Growth Model. Published at: [https://ec.europa.eu/commission/presscorner/detail/en/IP_22_1467], last accessed

on December, 2023.

10. Law 544/2001 on free access to information of public interest (2001). Published at: [https://rai-see.org/wp-content/uploads/2015/08/law_544_2001-regarding-the-free-access-to-information-of-public-interest.pdf], last accessed on December, 2023.
11. Lee, Y. B. (2017). Exploring the relationship between E-government development and environmental sustainability: A study of small Island Developing States. Sustainability, 9(5), 732.
12. Machlup, F. (1983). Knowledge. Its Creation, Distribution and Economic Significance. Volume III-The Economics of Information and Human Capital. New Jersey: Princeton University Press.
13. Mihaila, M. G. (2018). E-guvernarea, Romania 2000-2030. Orase inteligente si dezvoltare urbana. In Smart Cities International Conference (SCIC) Proceedings (Vol. 6, pp. 267-277).
14. Romania Resilience and Recovery Plan – RRP- (2022). Published at: [https://mfe.gov.ro/pnrr/], last accessed on December, 2023.
15. United Nations News (2018). Published at: [https://news.un.org/en/story/2018/07/1015272], last accessed on December, 2023.

nline Resources:

- Romania's national e-government portal. Available at: [https://e-guvernare.ro/], last accessed on December, 2023.
- Romanian Digital Authority (ADR) website. Available at: [https://www.adr.gov.ro], last accessed on December, 2023.
- Romania's ADR work-in-progress solutions. Available at: [https://www.adr.gov.ro/proiecte-in-implementare/], last accessed on December, 2023.
- Romania's Electronic Public Procurement System (SEAP). Available at: [https://e-licitatie.ro/], last accessed on December, 2023.
- Romania's Virtual Payment Window. Available at: [https://www.ghiseul.ro/ghiseul/public/], last accessed on December, 2023.
- Romania's Transport Licences Portal (SIAE). Available at: [https://www.autorizatiiauto.ro/Portal/], last accessed on December, 2023.
- Romania's AICI.GOV Portal. Available at: [https://www.aici.gov.ro], last accessed on December, 2023.
- Romania's Single Electronic Contact Point. Available at: [https://edirect.e-guvernare.ro/], last accessed on December, 2023.
- Romania's Portal for Digital Identity. Available at: [https://www.roeid.ro], last accessed on December, 2023.
- Code for Romania Action Plan. Available at: [https://www.code4.ro/ro/planul-nostru], last accessed on December, 2023.
- #ITforEnergy Project. Available at: [https://www.itforenergy.ro/], last accessed on December, 2023.

The importance of business analysis in development process

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Abstract: *These days, we are taking part at an increasing rate of business digitization, and without a doubt, we encounter difficulties in maintaining a clear overview of the business processes within an organization.*

Considering each business flow a puzzle piece of the entire company landscape, we aim to highlight the importance of documenting each 'working piece' with no other priorities. Having this focus in mind, as business intelligence and software developers, we can't imagine this puzzle with a missing piece.

Being aware of the fact that a solid base is built piece by piece, both the image of the company and its productivity can suffer because of omissions related to essential details, details that in the context of competition in today's marketplace end up making the difference between the clients' choices. So, each piece, each workflow, no matter how small, is essential to the overall success of a company.

In this paper, we wish to emphasize the importance of proper documentation that presumes a well-pointed business analysis, the foundation upon which a successful business thrives.

Key words: Business analysis, development, documentation, processes.

JEL: O - Economic Development, Innovation, Technological Change, and Growth

1. Introduction

In the fast-paced world of business, we are aware of the fact that every detail matters and ends up making the difference in the quality of the services delivered day by day. From the initial consultation to the final product, it's important to pay close attention to every aspect of the process. Companies strive to provide exceptional services and to be recognized as the best in their field.

Whether it's a small detail that might go unnoticed or a major issue that could disrupt operations, being meticulous is essential to ensuring that clients receive quality services. In order to meet the high expectations of their customers, companies must be meticulous in their approach to every aspect of their business.

Whether it's the way they communicate with clients, the quality of their products, or the efficiency of their processes, every detail matters when it comes to maintaining a competitive edge. It's these details that make the difference between a satisfied customer and one who won't hesitate to take their business elsewhere. So, as a result, it's crucial to maintain a focus on excellence and pay attention to all the details, no matter how small they may seem.

Therefore, taking into account what we described previously, we want to focus our attention on the importance of correctness in approaching the business analysis of the existing processes, but also on the future ones that will be developed.

2. Literature review

In this world of business analysis, correctness is key. It's not just about understanding the existing processes, but also anticipating the future ones. By paying close attention to the details and ensuring that everything is accurately documented, companies can stay ahead of the competition and avoid costly mistakes. Whether we are evaluating a current system or proposing a new one, it's vital to approach the task with precision and a keen eye for detail. The importance of getting it right cannot be overstated.

Correctness must always be a top priority in these activities because experiments and trial-and-error are not always the best options when it comes to business operations. Businesses need to have confidence that they're making the right choices when it comes to evaluating existing processes and deciding on new ones. After all, success in this area can spell the difference between profitability and stagnation, or even failure. It's crucial to understand that the importance of business analysis extends beyond the present.

An important perspective stands in how a company management introduces the notions and also develops an approach of documenting a business process through an application or a specific framework valuing all kinds of involved resources. Such concepts are well detailed in a book called "Business Analysis and Valuation: Using Financial Statements'' (Krishna, Palepu, Wright, 2020). This writing may be considered a comprehensive guide to understanding business from the Asia-Pacific region. With a wealth of real-life case studies and references to current research, the authors offer a practical and in-depth exploration of the issues facing businesses in this area. The book is particularly useful because it includes real-life case studies that outline

various business issues using multiple valuation tools, strategy analysis, overview analysis, ideas of how to implement accounting analysis and financial ones, prospective analysis such as forecasting, valuation theory and implementation. Moreover, beyond these tools, it presents applications from credit analysis and distress prediction, equity security analysis, merges and acquisition, communication and governance.

A well-known statement that best describes an employee who 'plays' the business analyst (BA) role within a company, bridges the gap between business processes and developers (Faur, 2023) because as this article states, a BA is in charge of the big picture of the entire process.

On the other hand, this analyst responsibility is not considered an easy one as it assumes different kinds of requirements, such as conducting interviews with internal or external stakeholders and discovering insights about projects, developing questionnaires – an efficient way to get input data about key areas, document analysis and prototyping (QAT, 2023) because software development projects are constantly under pressure to be completed quickly and efficiently. However, rushing into a project without proper analysis can lead to disastrous outcomes. Developers run the risk of building incomplete software that doesn't solve the problem it was intended to, or worse, having to rebuild the entire software from scratch when it's too late. To avoid such situations, business analysts often take on the role of product owner in agile development teams.

Other writings emphasize the advantages this matter brings – business analysis aim to increase the return of investment (ROI), decreases the costs, helps in decision making, opt for a cost-effective solution while focusing on the real business value, all these can be considered amplified in the context in which a dedicated application is used (Naranh, 2023). Another essential aspect that the author explains is the benefits of business analysis certification, for example one of the most recognized is from the International Institute of Business Analysis (IIBA). It is a renowned global association dedicated to advancing the business analysis profession and supporting the growth of business analysts worldwide. By developing certifications that reflect the most in-demand skills in the current market, IIBA enables certificate holders to stand out in a crowded field and demonstrate their expertise. By earning a BA certification, an employee can demonstrate proficiency in a variety of areas, such as requirements analysis, stakeholder management, and enterprise analysis. This can be really helpful, not only does it require a significant investment of time and money, but it can also open up new career opportunities.

As an employer, following statistics from IIBA's Global Business Analysis Salary Survey (IIBA, 2023), helps in increasing credibility of job applicants who have such accreditation, who are interviewed for a position in this area of expertise, also possible future company employees. This certification adheres to global standards outlined in the BABOK Guide, providing a benchmark for commonly accepted practices in business analysis. This one not only shows prospective employers that you have the necessary skills, but also the ability to bring the best and most up-to-date practices to the table.

Besides this previously mentioned distinctive aspect, the approach and implementation techniques can be taken as a standard that makes the difference between the different existing methods. With statistics and advanced technologies, business analytics techniques allow companies to gain knowledge about their operations, demographics, and market trends (Mansoor, 2023).

There are three forms of business analytics: descriptive, predictive, and prescriptive. Descriptive analytics uses past data to provide insights into what has already happened. Predictive analytics relies on data and statistical models to forecast future trends. Prescriptive analytics uses data and algorithms to suggest actionable solutions for business problems (Cadle, 2023). These ones cover everything from gathering data to analyzing it and making impactful choices. To fully understand the process of business analytics, it's vital to have a grasp of its various forms.

All these aspects and details related to this area of activity, put together, end up forming, as author George M. Giaglis mentions in his article (Giaglis, 2001), a taxonomy of business analysis modeling.

3. In depth

Creating an overview of the role of business analyst we can say that in the software development lifecycle this resource is critical in ensuring the success of any project. Typically, the business analyst communicates with various stakeholders and identifies their requirements. After gathering this information, the business analyst analyses, documents and communicates the requirements to the development team. This process helps in bridging the gap between the technical team and the business team. It is not always easy to measure the performance of a business analyst, but there are certain indicators like the quality of requirements, customer satisfaction, project timeline, and the success of the project that business analysts can use to measure their performance.

Analytical techniques in business are essential for the success of any organization. Among the wide array of techniques available, Strengths, Weaknesses, Opportunities, and Threat (SWOT), Customers, Actors, Transformation process, World view, Owners, Environmental constraints (CATWOE), Mission, Objectives, Strategies and Tactics (MOST), Political, Economic, Social, Technological, Environmental, and Legal (PESTLE), Business Process Management (BPM), and Six Hats thinking are some of the most popular ones (CPrime, 2023). These techniques are versatile and can be applied across various projects and industries. By effectively analyzing business requirements, these strategies can optimize operations and align them with the business mission. However, to excel as a business analyst or pursue a career in this field, one must have an in-depth knowledge of the top techniques. The top 10 business analysis techniques are a must-know for any aspiring business analyst.

Following techniques above, a basic piece that supports a large part of them is represented by the design of representative diagrams for the targeted processes (Marshall, 2000). One of the key aspects of successfully implementing efficient processes is the design of representative diagrams. Creating clear and easy-to-understand diagrams is essential for facilitating communication and collaboration within a technical process development. From flowcharts to swimlane diagrams, visual representations of processes provide a common language for all involved parties. By ensuring that everyone is on the same page and understands the steps involved, teams can work together more effectively to achieve their goals. These diagrams are a key tool in understanding and troubleshooting processes (Becker, 2000).

A rather controversial side these days, which is essential to be addressed as a chapter of the

subject, is the one related to security. Both in the analysis of the process and in the implementation of the targeted solution, the aspects related to the security of the information and data with which the process works is vital, especially in the context where these inputs are sensitive, like customer data. Security in business processes is a crucial aspect that needs to be taken into consideration. Numerous empirical studies have shown that customers, end users, and business analysts are capable of expressing their security needs at the business process level. Thus, it becomes essential to propose an integration of security requirements through business process modeling. This proposal aims to use the Business Process Modeling Notation extension for modeling secure business processes through Business Process Diagrams (Rodriguez, Fernandez-Medina, Piattini, 2007). By incorporating security needs into the initial stages of business process modeling, organizations can ensure that their systems and data are protected from potential threats. This not only increases the level of security but also enhances the overall efficiency of the business process.

These aspects related to security must be integrated both in process documentation, but especially, when it comes to software development in process design document (PDD) and software design document (SDD). PDD is a document that outlines everything about a particular product, including its features, target audience, and value proposition. This document is crucial for stakeholders, as it helps them to understand the product's scope and objectives. SDD, on the other hand, is used to describe the software's architecture, design, and functionality. This document is essential for developers as it helps them to easily understand how to build the software effectively. These documents serve as a guiding roadmap for the development team, ensuring that everyone is on the same page and moving in the same direction.

Two overviews without which a software solution cannot take SDD documentation into account are those of the process in AS IS form and its projection in desired state, TO BE. The 'as is' form outlines the current state of the process, including any existing systems and structures, while the 'to be' projection predicts how the process will look after the proposed software solution is implemented. Without a clear understanding of the current process, it is impossible to identify areas for improvement or potential roadblocks and without projecting the process into its future state, there is no way to design a solution that will meet the needs of the organization. By taking the time to thoroughly analyze the current process and consider its ideal state beforehand, a software solution can be designed to best fit the unique needs of the business, ensuring a successful outcome.

One way to achieve the goal of staying ahead of the market competition is by implementing a Center of Excellence (CoE) that's specifically dedicated to business analysis area within a company.

Such a CoE can bring various advantages to a company, such as ensuring standardization of processes and methodologies across different business areas (Roland, 2023). Additionally, a CoE can provide a centralized and efficient approach to training and development for business analysts, which can result in a highly skilled and motivated workforce (Casey, 2013). Some other advantages are that it allows for a centralised repository of knowledge and expertise, mapping process portfolio, identifying and articulating keen eye details (Schedlbauer, 2023) while providing a standard approach to be utilised throughout the company and can help companies to quickly identify and resolve issues that could impact their bottom line. This can in turn lead to a significant increase in efficiency and productivity. It also can help in ensuring consistency in terms of quality and results, as well as facilitate sharing of best practices.

4. Results and discussions

Proper analysis of existing processes lays the groundwork for future ones, and a misstep along the way can be costly. We always have to strive to approach business analysis with accuracy and precision in mind.

By centralizing business analysis expertise, companies will reduce duplication of effort, better align business strategies with IT initiatives, and identify opportunities for innovation and growth. The research's results make it clear: a business analysis center of excellence (BACoE) is a pathway to excellence. Having this in mind, it is clear that such a center can help businesses of all sizes to achieve greater success and thrive in today's competitive marketplace.

In order to keep pace with the rapidly changing landscape, it is crucial for businesses to have a thorough understanding of their internal and external environment. This is where business analysis plays a critical role in the development process. By carefully analyzing and evaluating various aspects of their business, such as market trends, customer behavior, and critical success factors, businesses can identify key areas of improvement.

A significant contribution to this result can be brought by the contribution of the implementation and gradual development of a CoE focused on business analysis - a valuable asset for any company looking to optimise their operations and maximise success.

A well implemented business strategy can help in driving organizational growth and achieve strategic objectives. The study found that companies that prioritize business analysis throughout the development process see an increase in efficiency, a reduction in errors and defects, and ultimately, better outcomes. When business analysts are included in the planning stage, they are better able to understand the organization's needs and translate them into actionable strategies. This leads to more effective communication, streamlined processes, and a better final product.

5. Conclusions

Business analysis is a vital element of the development process for any company. With the role of technology increasing every day, businesses need to keep up with the changing perspectives of market demands.

The analysis provides insights into how a company can tap into the target audience and create excellent products as well as delivered services. By conducting a thorough analysis, companies can understand their strengths and weaknesses and create strategies to improve their implementation approaches. The significance of business analysis cannot be overstated, and companies that invest in this area can expect to see significant improvements in their development processes.

Summing up, incorporating business analysis into the development process ensures that a company remains competitive in the day to day marketplace area. It allows companies to tailor their products and services to meet the standard needs of their audience customers and gain a needed competitive advantage. It can be considered an indispensable tool that every business should embrace in their development process.

REFERENCES:

1. Krishna, G., Palepu, G., Healy, P.M., Wright, S., Bradbury, M., Coulton, J.: "Business Analysis and Valuation: Using Financial Statements", 3rd Edition, Cengage AU, (Sep 24, 2020).
2. Faur, A., "Why Business Analysis is the Stepping Stone of Software Development", Fabrit Global, https://blog.fabritglobal.com/business-analysis-software-development/, last accessed: 2023/09/30.
3. QAT Global, "Business Analysis in Software Development Workflow – The importance of business analysis in software development", https://qat.com/importance-business-analysis-software-development/, last accessed: 2023/09/30.
4. Naranh, M., "Business Analysis Importance: A detailed Guide", Business Management, Knowledgehut (Sep 29, 2023), https://www.knowledgehut.com/blog/business-management/business-analysis-importance#what-does-a-business-analyst-do-and-why-is-their-role-so-important?%C2%A0, last accessed: 2023/09/30.
5. International Institute of Business Analysis, IIBA.org, Global State of Business Analysis Survey, https://www.iiba.org/professional-development/career-centre/global-ba-salary-survey/, last accessed: 2023/09/30.
6. Mansoor, M., "Top 10 Effective Business Analysis Techniques", Business Management, Knowledgehut, (Sep 08, 2023), https://www.knowledgehut.com/blog/business-management/business-analysis-techniques, last accessed: 2023/09/30.
7. Cadle, F., Paul, D., Turner, P., "Business Analysis techniques – 72 essential tools for success", ISBN 978-1-906124-23-6, BCS The Chartered Institute for IT, (2010).
8. Giaglis, G.M. A Taxonomy of Business Process Modeling and Information Systems Modeling Techniques. International Journal of Flexible Manufacturing Systems 13, 209–228 (2001). https://doi.org/10.1023/A:1011139719773, Springer.
9. CPrime, "Why is Business Analysis important in software design?", https://www.cprime.com/resources/blog/why-is-business-analysis-important-in-software-design/, last accessed: 2023/09/30.
10. Marshall, C., "Enterprise Modeling with UML - Designing Succesful Software through Business Analysis", Addison-Wesley Longman, ISBN 0-201-43313-3, (2000).
11. Becker, J., Kugeler, M., Rosemann, M., "Process Management – A guide for the Design of Business Processes – with 83 Figures and 34 Tables", ISBN 3-540-43499-2, Springer, (2003).
12. Rodriguez, A., Fernandez-Medina, E., Piattini, M., "A BPMN Extension for the Modeling of Security Requirements in Business Processes", IEICE Transactions of Information and Systems, Vol. E90-D, No. 4, pp. 745-752, (Apr 01, 2007), ISSN 1745-1361, https://search.ieice.org/bin/summary.php?id=e90-d_4_745, last accessed: 2023/09/30.
13. Roland, R., "Is a Business Analysis Center of Excellence (BA CoE) still relevant?", Modern Analyst, https://www.modernanalyst.com/Resources/Articles/tabid/115/ID/3058/Is-a-Business-Analysis-Center-of-Excellence-BA-CoE-Still-Relevant.aspx, last accessed: 2023/09/30.
14. Schedlbauer, M., "Create a Business Analysis Center of Excellence", Corporate Education Group, https://www.corpedgroup.com/mobile/ba/DefiningBAExcellence.asp, last accessed: 2023/09/30.
15. Casey, G., "How a Business Analysis Center of Excellence Helps You – Center of Excellence", EnFocus Solutions, (Apr 08, 2013), https://enfocussolutions.com/how-a-business-analysis-center-of-excellence-helps-you-center-on-excellence/, last accessed: 2023/09/30.

The relationship between individual and public spending on education and the quantitative and qualitative outcomes of education processes and systems

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***Abstract**: The rate of return to schooling (returns to investment in education) equates the value of an individual's lifetime earnings to the present value of educational costs. For an investment to be economically justified, the rate of return should be positive and should be higher than the alternative rate of return. For the individual, weighing the costs and benefits means that they should invest if the rate of return exceeds the private discount rate (the cost of borrowing and an allowance for risk). The costs incurred by an individual are the earnings deferred while studying, plus any tuition fees or incidental expenses incurred. Private benefits amount to how much an educated person earns (after taxes) compared to a less educated person. More or less, in this case refers to adjacent education levels - for example, university graduates compared to high school graduates.*

***Keywords**:* education system, spending on education, outcomes of education processes

JEL Classification: H52, I22, I26

1. Introduction

Research on the rate of return on investment in education has its roots in the writings of classical economists (Adam Smith, 1776; Marshall, 1890), but the link between education and earnings has only recently emerged and formal modeling has only occurred much more recently (Schultz, 1960, 1961; Becker, 1964; Mincer, 1974; Chiswick, 2003). The concept of the rate of return on investment in education is very similar to that of any other investment. It is a summary of the costs and benefits of the investment incurred at different points in time and is expressed in an annual (percentage) return, as for savings accounts or government bonds. The popularity of estimating returns to education stems from the resulting efficiency, equity and financing implications. The ranking order of returns by level or type of education and a comparison with alternative investment returns can help education policy makers make informed investment decisions. In terms of resource efficiency, spending on human capital is a good investment. For example, in the United States, the average return on long-term stocks and bonds from 1966 through 2015 was 2.4 percent compared to 10.5 percent total private returns on education investments (Psacharopoulos and Patrinos, 2018).

The earnings premium associated with educational attainment suggests that productivity increases as people acquire additional qualifications. An alternative view is that earnings increase with education due to credentialing effects. This refers to the idea that higher levels of education are associated with higher earnings, not because they directly increase productivity, but because they certify that the worker is capable of being productive. In this sense, education merely makes workers choosier in terms of their unobserved attributes; it does not necessarily increase their intrinsic productivity (Psacharopoulos and Patrinos, 2018).

In the case of tertiary education, individual performance varies significantly across fields of study, institutions, and individuals. This variation often results from a combination of students' lower level of basic skills when entering tertiary education, insufficient quality and quality assurance in the context of a sustained expansion of supply, and a lack of mechanisms to link with employers and provide regular information on labor market requirements and the returns to different study programs. As a result, while returns to the average level of education can be considered relatively high, because of these problems, tertiary education cannot bring high returns for everyone. When higher education institutions and vocational training institutions design their program offerings, and students choose programs and study institutions without clear information about program quality and labor market prospects, the results can vary significantly and, in some circumstances, can even be negative. Investments in higher education must therefore focus on quality assurance and take into account current outcome objectives (Jula et. al., 1999), but also be attuned to the changing needs of a dynamic environment in terms of skill demands, occupational profiles and types of tertiary institutions, and the ways in which the knowledge and skills required are delivered through study programs (Arnhold and Bassett, 2021).

2. Literature review

Private returns to investment in education have been estimated for the countries of the world for different dimensions of education and training policies (Table 1). They tend to follow a

U-shaped curve as a function of the level of education: they decrease for secondary compared to primary education, but increase again for tertiary education. The estimates revealed some important findings (Psacharopoulos, 2006; Gunderson and Oreopoulos, 2010):

- Private returns to investment in education are localized in the range of 6-15% (Gunderson and Oreopoulos, 2010) and are higher the lower the level of a country's per capita national income, reflecting the relative scarcity of human capital in poorer countries (10.9% for low, 10.7% for medium, 7.4% for high and 9.7% world average - see also Fasih et al., 2012);
- Vocational secondary education shows lower returns compared to general secondary education because the former involves higher expenditure.
- Investments in female education have higher returns because the lower opportunity cost of educating females leads to higher total returns.
- Private sector workers enjoy higher returns on private investment in their own education than public sector workers because more competitive private sector employers recognize the higher productivity of more highly educated workers (Psacharopoulos, 1994).
- Returns to private investment in education are subject to diminishing returns, tending to decline when human capital becomes more abundant.
- Investment in tertiary education has shown increasing trends in the most dynamic economies (including developing countries), reflecting rising demand for highly educated workers able to cope with technological advances (consistent with the hypothesis of complementarity between education investment and technological advancement - see, for example, de la Fuente and Ciccone, 2002; London Economics, 2005; Montenegro and Patrinos, 2014; Montenegro and Patrinos, 2014; Fink and Peet, 2014; Aslam, 2009; Aslam, 2009; Montenegro, 2001; Mitra, 2019).
- Returns tend to be higher for professional fields such as engineering, medicine, business and the sciences and lower in fields such as the social sciences and humanities (particularly in the arts - Gunderson and Oreopoulos, 2010).

Table1. Returns to private investment in education by selected dimensions of education and training policies

Dimension of education and training policies	*Private return on investment in education and training (%)*
Level of development	
High income countries	
Low income countries	10.9
Type of curriculum	
General	11,7
Vocational	10,5
Gender	

Male	8,7
Female	9,8
Sector of employment	
Private sector employees	11.2
Public sector employees	9.0
Change over time, 15 years	
Primary education	-2.0 percentage points
Ter tertiary education	+1.7 percentage points

Source: Taken from Psacharopoulos (2006).

More recent global estimates (Psacharopoulos and Patrinos, 2018) show that private returns to investment in education for an additional year of schooling averaged 8.8%, one percentage point lower than previous estimates (Psacharopoulos and Patrinos 2004), which can be interpreted as an argument in favor of the so-called education-technology race; the demand for skills outstripping the supply of adequate skills (Goldin and Katz, 2008; Acemoglu and Autor, 2012).

When the education system "keeps pace" with the increased demand for skills driven by the advancement of technology, average income levels rise and social inequality decreases. Thus, a higher level of inequality is largely determined by a much higher level of wages offered for high-level skills (which is documented to have happened globally after the 1970s - Burgess, 2016). The return on private investment in education has, however, increased since the 2000s and is estimated to be around. 9.1%, but education still seems poised to lose the race with the advance of technology, even in the context of increasing educational provision (see also Gunderson and Oreopoulos, 2010).

However, the previous trend of higher returns to private investment in education in lower (9.3%) and middle (9.2%) income countries compared to high-income countries (8.3%) is maintained. The previous trends of higher returns for women than for men and higher returns for private than public sector employees are also maintained (Psacharopoulos and Patrinos, 2018).

3. Direct and indirect effects of education on the wider economy and the growth process

A related issue of individual returns to investment in tertiary education is the case of students who engage in the labor market while still studying and how much they earn in paid jobs and how important this income is for their total budget. On average, half of the income of all working students (both during and/or outside the course period) consists of earnings from paid jobs. For example, the median amount that students earn (expressed in PPS: standard purchasing power parity) differs from country to country, with a median of 557 PPS across the European countries participating in the Eurostudent VII survey. Earnings from work are relatively important for the total income of students in Poland, Malta, Iceland, Iceland, Lithuania, Estonia, Portugal and Romania. In these countries, earnings from work account for at least two-thirds of their total income (Hauschildt et al., 2021). Thus, in the Netherlands, Sweden and France, earnings from work are less important for a student's budget; in these countries, this income accounts for a third or less of the total student income. In Estonia, Malta and Romania, the median income

of working students is the highest (over 800 PPS) compared to the other countries surveyed, while in Ireland, Georgia, the Netherlands, Sweden, the Netherlands and Turkey, the median income is relatively low (less than 400 PPS).

The importance of labor market employment while still at university in terms of student budgets can be demonstrated by combining the proportion of students with a paid job during the course and the income generated by that job as a percentage of total student income. The higher the position in the top right-hand corner of this matrix, the more hours students work during their courses and the more they depend on their income from that job.

According to these criteria, a first group includes six countries: Malta, Estonia, Iceland, the Czech Republic, Estonia, Slovenia, the Czech Republic, Switzerland and Iceland, where the percentage of working students is high and the share of income they earn from work is a significant part of their income. Austria, Norway, Germany and the Netherlands are another group of countries where the percentage of working students is high, but the importance of work for their total budget is considerably lower. These are countries where students typically work relatively few hours per week. The other group of countries is Luxembourg, Sweden and France, where the number of working students is low and the proportion of income from earnings from employment is low compared to other countries. Finally, in countries such as Finland, Poland, Hungary, Lithuania, Croatia, Georgia, Turkey, Portugal and Romania, relatively small numbers of students work, but their wages make up a significant part of their income. Ireland scores average: the share of students in work and the share of earnings from work in total income correspond closely to the average of the EUROSTUDENT VII survey (Hauschildt et al., 2021).

The social rate of return (social return) includes society's expenditure on education - for example, money spent on renting buildings and paying teachers' salaries. The social attribute of the estimated social rate of return refers to the inclusion of the total resource cost of the investment - the direct costs borne by the government and the deferred earnings of students as they invest in their education (Jula and Jula, 2019). Ideally, the social benefits should include non-monetary benefits of education, such as the number of lives saved because of improved sanitation conditions a woman pursued because she received more education. Given the little empirical evidence on the social benefits of education, the social rate of return is usually based on the directly observable monetary costs and benefits of education. Since costs are higher when calculating the social rate of return relative to the private rate of return, social returns are usually lower than a private rate of return. The difference between private and social rates of return reflects the degree of public subsidization of education - as virtually the only difference is the addition of social costs (Psacharopoulos and Patrinos, 2018).

The social returns to investment in education have been estimated by various methods since the mid-20th century (see, for example, Schultz, 1961b; Becker, 1964; Becker and Chiswick, 1966; Duflo, 2001). Early results have shown that they tend to decrease with increasing educational attainment, following the pattern of diminishing returns (Psacharopoulos, 1981; Deny, Harmon and Lydon, 2002), as they take into account the full resource cost of education. For example, globally, average social returns to investment in primary education amounted to 18.9% at the turn of the millennium, 13.1% for secondary education and 10.8% for tertiary education (Psacharopoulos and Patrinos, 2004). However, a number of OECD (2005) estimates (Psacharopoulos, 2006) show positive differences in the social returns to secondary versus tertiary education ranging from 4 percentage points (Switzerland) to 18 percentage points (Sweden). On the other hand, extended

estimates have shown that the social returns to investment in tertiary education can substantially exceed the returns to other types of investment (Cohn and Hughes, 1994; Psacharopoulos, 2006). More recent studies have also shown in some cases the presence of a U-shaped curve also for the social returns to investment in education (see e.g. Patrinos et al., 2019 for Turkey).

The same more recent global estimates (Psacharopoulos and Patrinos, 2018) show that the trends from the pre-2000s periods of declining trends with increasing per capita income and educational attainment also hold for the social returns to investment in education. On the other hand, the level of social returns to investment in tertiary education are still high both in developed countries (10.6% compared to 10.2% for returns to investment in secondary education), but especially in developing countries (16.4% compared to 10.2%), where the shortage of human resources with high and adequate levels of qualification remains significant (Psacharopoulos and Patrinos, 2018).

The UK Commission on Growth and Development (2008) concluded that the social returns are likely to outweigh the private returns to higher education through the wider contribution of educated individuals to society (Grant, 2017). However, returns that focus solely on private and public financial rewards fail to capture the wider benefits of higher education manifested through entrepreneurship, job creation and good economic and political governance, together with the positive impact of research on economies. Tilak (2003) has also shown that the proportion of the adult population with ter tertiary education (a measure of the stock of human capital) is an important indicator of the level of development. This "stock" indicator represents a country's cumulative efforts in higher education development over the years. The higher the stock of adult population with higher levels of education, the higher the potential for economic growth (Grant, 2017).

The rationale for state intervention in education financing derives from both market failures and issues of redistribution/equality of opportunity (Canton et al., 2018). Regarding the former, two forms of market imperfections have been emphasized in the literature on the economics of education: human capital disseminations (which are generally associated with knowledge production and human capital accumulation) and capital market imperfections. Human capital spillovers imply that the benefits of education accrue not only to the individuals who make the investment, but also to others. Therefore, human capital spillovers create a trade-off between private and social returns to education, which may lead to underinvestment in education because the individuals making the expenditure cannot approach the full returns. State intervention can address this market failure through the public provision of education and/or by subsidizing education systems or parts of them (mainly in the form of direct funding of education institutions). For example, students may find it difficult to finance their education through the private capital market because of its imperfections. Investment in education can be costly, and financing such expenditure through the private capital market tends to be difficult mainly because of the asymmetry between the cost of education and the cost of financing it. Moreover, capital market imperfections tend to create unequal access to education, thus limiting vertical social mobility (e.g. children from economically disadvantaged families would have difficulties accessing higher education). The standard remedy to address these capital market imperfections is the provision of state-backed student loans. Often such loan schemes also have an element of subsidization, as the loans are typically provided on quite attractive terms (e.g. interest rates below market rates) (Canton et al., 2018).

Another objective of public education is to provide equal access to education (as a matter of social fairness). Parental resources differ and, even when banks are willing to provide loans for education, children from less advantaged families may be discouraged from going to school. In most countries, primary and secondary education is the responsibility of the central or regional government and aims to provide equitable access for all. Issues of redistribution therefore provide an additional rationale for public/state intervention (Canton et al., 2018).

4. Quantitative and qualitative outcomes of education processes and systems

Three main areas of research can be identified in studies on the relationship between educational resources and educational outcomes: one that focuses on school inputs (teacher experience, class size, number of schools, etc.), one that focuses on financial inputs, and one that focuses on institutions and institutional quality. In all three cases, the international evidence is rather mixed (Hanushek and Woessmann, 2007). In terms of the efficiency of public spending on education, there are two main groups of studies in the literature (see Canton et al, 2018, for literature review): studies that typically consider public spending on education as an input into the education production function, often focusing on the efficiency of public spending and distinguishing between different government functions such as health and/or education, and studies that often postulate an education production function with a broader range of inputs, including both monetary and non-monetary inputs. In terms of education policy objectives, these can be grouped into three groups of measurable outcomes (Canton et al., 2018): those related to quantity (e.g. tertiary attainment), quality (cognitive skills, proxied by PISA scores or other international tests) and inclusion (e.g. represented by NEET rates or inclusion indices).

There is some evidence of a positive relationship between spending per pupil and average student performance. As spending on educational institutions per pupil increases, so does a country's average performance; but the rate of increase declines rapidly. However, while education needs to be adequately resourced and is often under-resourced in developing countries, high levels of per-pupil spending are not necessarily necessary to achieve excellence in education (OECD, 2019a). Some studies suggest that such a relationship is non-linear. In countries with cumulative spending per pupil for ages 6-15 below USD 50,000, higher spending on education is strongly associated with higher PISA test scores on science study. Above this threshold, the relationship is difficult to assess, suggesting that improving education outcomes requires more than money (OECD, 2016a, Smidova, 2019).

On the other hand, there is also negative evidence on the relationship between (public) education spending and student performance. For instance, Hanushek and Woessmann (2007, 2011) showed that, on average, countries with high levels of education spending performed at the same level on international student tests (PISA) as countries with low levels of education spending. This picture shows that spending alone is not associated with student performance and can also be found for other international student tests such as TIMSS. An in-depth study of changes over time in education spending and student performance has shown that education spending per pupil increased substantially in real terms in OECD countries between the early 1970s and the mid-1990s, but comparisons of test scores in 1970 with those in 1994/95 suggest that there were no significant improvements in average performance for students in these countries (Hanushek and Woessmann, 2007). In most cases, the lack of a significant positive cross-country association

between expenditure per pupil and educational attainment holds when numerous other determinants, such as family background and school characteristics (including instructional time) are accounted for in a regression framework (Hanushek and Woessmann, 2011). In sum, the general pattern of cross-border analyses suggests that quantitative measures of school inputs, such as expenditure and class size, cannot explain cross-border variation in educational attainment. In contrast, several studies tend to find positive associations between student achievement and the quality of instructional materials or teacher quality (Hanushek and Woessmann, 2011).

In the case of the EU27 Member States, these claims are also empirically supported by a number of data; thus, countries that do not have very high levels of per pupil expenditure but have good reading scores can be identified, and conversely, countries that have high levels of per pupil expenditure but reading performance does not show a strong positive correlation with it (Table 2). Among the EU27 Member States, the former includes countries such as Poland, Estonia and Ireland and the latter countries such as Luxembourg, Austria, the Netherlands and Germany. Moreover, if we also consider the objective of inclusive education, capable of alleviating inequalities, we can observe that the high level of investment in education in some countries is not only not reflected in the level of pupils' performance (in reading in this case), but also in the narrowing of the gaps between socially advantaged and socially disadvantaged pupils (Luxembourg, Belgium, Germany, Austria, France, Germany, Belgium, Austria, Portugal) or in the improvement of the latter's performance (Luxembourg, Belgium). On the contrary, countries that have invested smaller amounts (but in a more efficient way in terms of results) have also achieved better results both in terms of reducing the achievement gap between advantaged and disadvantaged pupils and in improving the performance of disadvantaged pupils (Ireland, Slovenia, Estonia, Latvia, Slovenia, Croatia, Estonia). However, there is also evidence that low levels of investment in education in EU Member States not only do not lead to improved performance, but also do not lead to a reduction in inequalities in outcomes or to improved performance of disadvantaged pupils (Hungary, Romania, Bulgaria). The relationship between the level of investment in education and the quality of outcomes of educational processes is thus very complex and highly country-specific in the EU27 Member States, but also in other countries.

Table 2. Relationship between average expenditure per pupil between the ages of 6 and 15 and average reading literacy performance on PISA tests (thousands of US dollars, in PISAs)

Countries	*Average expenditure per pupil aged 6-15 (thou. of USD, at PPP)*	*Country Average reading scores*	*Average reading literacy gap between*	*Percentage of disadvantaged pupils who are top performers in reading (%)*
Qatar	326	407	93	9
Luxembourg	209	470	122	8
Macao (China)	149	525	31	20
Austria	140	484	93	10
Norway	136	499	73	12
USA	122	505	99	10

Brunei Darussalam	119	408	103	9
Iceland	117	474	72	13
Sweden	114	506	89	11
Belgium	113	493	109	9
South Korea	113	514	75	13
Finland	111	520	79	13
United Kingdom	110	504	80	14
Singapore	109	549	104	10
Australia	107	503	89	13
Cyprus	104	424	69	13
Netherlands	102	485	88	13
Taiwan	101	503	89	12
Germany	99	498	113	10
Japan	98	504	72	12
Canada	96	520	68	14
France	92	493	107	10
Hong Kong (China)	91	524	59	16
Ireland	90	518	75	13
Slovenia	88	495	80	12
Italy	88	476	75	12
New Zealand	85	506	96	12
Malta	83	448	85	13
Portugal	82	492	95	10
Israel	80	470	121	8
Czech Republic	69	490	105	9
Poland	68	512	90	11
Slovakia	66	458	106	9
Latvia	66	479	65	12
Estonia	64	523	61	16
Greece	63	457	84	12
Malaysia	61	415	89	10
Lithuania	53	476	89	11
Hungary	53	476	113	8
Croatia	52	479	63	15

Chile	50	452	87	11
Belarus	47	474	102	9
Argentina	44	402	102	8
Russian Federation	44	479	67	13
Uruguay	43	427	99	9
Brazil	38	413	97	10
Turkey	38	466	76	15
Bulgaria	31	420	106	6
North Macedonia	30	393	80	13
Colombia	30	412	86	10
Mexico	29	420	81	11
Bosnia and Herzegovina	28	403	58	13
Peru	27	401	110	6
Thailand	27	393	69	13
Ukraine	27	466	90	12
Dominican Republic	26	342	65	12
Kazakhstan	25	387	40	16
Romania	25	428	109	9
Serbia	24	439	73	13
Montenegro	22	421	55	14
Moldova	21	424	102	8
Panama	20	37	95	9
Jordan	19	419	64	12
Indonesia	15	371	52	14
Philippines	8	340	88	8

Source: taken from OECD (2019a), based on data from the PISA 2018 Database.

While there are undoubtedly sufficient reasons to invest in human capital and also an economic argument for comprehensive public intervention in education, the fact that Europe lags behind other world regions in education raises the question of whether there is simply too little investment in education or whether this is rather due to inefficiencies in the corresponding spending on education (Canton et al., 2018). Clements (2002) was among the first to systematically assess the efficiency of public spending on education in Europe. He defined public spending on primary and secondary education as input variables and levels of educational attainment

and performance on international examinations as outcome variables. The results of his study showed that 25% of education spending at EU Member State level is wasteful and concludes that improving the efficiency of education spending in Europe is more important than increasing the level of education spending. Considering public spending on tertiary education, St Aubyn et al. (2009) and the European Commission (2010a) conclude that autonomy is an important factor in the efficiency of tertiary education in Europe. The authors' analysis is based on a cost function that relates tertiary education-relevant inputs to the number of graduates and academic publications (Canton et al., 2018).

Based on an efficiency frontier approach, Canton et al. (2018) show that in EU and other European countries, public spending on education is nevertheless positively correlated with the quantity and quality of educational outcomes. In general, the empirical results indicate that some countries perform well compared to a common efficiency frontier, but might do even better, as shown by comparing them to their specific frontier, while for other countries the opposite is true, i.e. they perform well compared to their own frontier but seem to lag behind in cross-country comparisons. In this case, the results suggest that further improving the efficiency of these countries in terms of spending on education in the context of already existing education systems is reaching a limit and efficiency improvements could only be achieved through structural changes in education systems (i.e. moving their individual frontier outwards and thus re-approaching the common efficiency frontier for all Member States).

Some EU27 countries manage to achieve high efficiency in the "quantity", "quality" and "inclusion" dimensions of education, such as the Netherlands, other countries achieve a favorable balance in two of the three dimensions, such as Germany or Sweden. In contrast, for example, Bulgaria, Italy and Romania perform relatively poorly on most of the three dimensions of education, while Cyprus and Lithuania are interesting cases in that they perform quite well in producing high levels of tertiary education, but much less well in producing high levels of cognitive skills and inclusion. In terms of tertiary attainment rates, Ireland and Lithuania set the frontier in 2015, as these countries had among the highest tertiary attainment rates at the time, while spending relatively moderate amounts on tertiary education. Italy, Malta and Romania all have relatively low tertiary attainment rates, but differ in terms of efficiency levels: while in Malta and expenditure is relatively high, in Romania it is relatively low. In terms of quality (PISA scores), no country reached the efficiency frontier in 2015.Estonia and Finland were closest to the border, while Cyprus and Romania with very low levels of PISA scores - but high levels of spending in the case of Cyprus - were furthest away. In terms of inclusion (NEET rates), Germany, the Netherlands and Sweden were closest to the efficiency frontier in 2015, while Greece and Italy with very high NEET rates (i.e. low non-NEET rates) were relatively far from it. The latter indicates that NEET rates, beyond the efficiency of education spending, are also driven by a number of other factors (e.g. NEET rates driven by the economic and financial crisis). However, in the medium to long term, the empirical relationship between education spending and NEET rates appears to be quite robust (Canton et al., 2018).

Public spending on education in EU Member States has become increasingly efficient in recent years, particularly in terms of increasing the number of people with tertiary education (also an EU and national target linked to the Europe 2020 Strategy). In terms of tertiary education rates, efficiency improvements have been tremendous between 2002 and 2015, while spending has remained comparably stable. For example, in Malta, the tertiary education level increased

from 9% to 31%, while expenditure remained at around 5%; similar figures apply to Romania. Conversely, in France efficiency improvements have not been as large because tertiary attainment was already relatively high at the 2002 level. All countries were very close to their individual borders in 2015, which means that further significant improvements can only be made by changing the education system, thus shifting country-specific borders outwards (changing the boundaries of the established national education system). Therefore, to improve further (i.e. increase tertiary graduation rates), a country-specific frontier would have to be shifted outward by changing the production technology, i.e. changing national education systems and/or introducing new education techniques (Canton et al., 2018).

In turn, the empirical results of the efficiency reviews suggest that there remains room for further improvements in quality and inclusion. There is no common trend across all EU Member States in terms of PISA scores or NEET rates. In terms of quality (PISA scores), around one third of countries have low efficiency scores over time, which is alarmingly low. The empirical results suggest that all countries have room to improve efficiency compared to their own frontier. Looking at NEET rates - i.e. looking at inclusion - the evidence suggests that around two thirds of Member States have low efficiency scores over time, i.e. this trend is also going in the wrong direction. The empirical results suggest that Cyprus and Greece seem to have room to improve their efficiency scores even when considering structural features as given, while Romania and Sweden are close to their own borders, but Sweden performs relatively well in terms of inclusion (since it is also the country closest to the common border in terms of NEET rates), while for Romania the corresponding finding suggests that there is room for further improvement, given the best performing European countries. However, the empirical results suggest that further improvement in inclusion in Romania (to the extent that it is driven by spending on education) cannot be achieved together with the current framework of the national education system (inter alia, also driven by removing inefficiencies in the system) (Canton et al., 2018).

Conclusion

In view of the above-mentioned problems, an answer to the question of where to place greater emphasis in the education policy mix (quantity, quality and/or inclusiveness) needs to be country-specific, taking into account examples of good practice observed in other EU Member States. Depending on the reason that prevents further improvements - i.e. either waste in education spending (remaining inefficiencies) or operating close to the boundaries of the country-specific education system (capacity constraints) - the policy and implementation response will be different. Undoubtedly, there is no blueprint for an ideal education policy mix, as national education systems all possess quite specific characteristics, with strong not only socio-economic but also historical roots (and whose possible reorientation and change is not easily addressed in the short term); in other words, there is no single 'European or EU' solution for education policy-making (Canton et al, 2018). Policy recommendations can then be derived from comparing individual solutions and learning about best practices in education policy and education system design in countries that appear to be similar. This could be particularly relevant for educational issues that pose new challenges to Europe's existing education systems in terms of new learning needs and methods triggered e.g. by globalization, climate change impacts, disruptive technological progress (including digitization), resource depletion and increased intra- and inter-state

insecurity. In this context, in order to foster both efficiency and equity, public spending policies need to be appropriately designed for each stage of the life cycle (from early education to children's education to adult learning), which should be combined with a regulatory framework that ensures accountability and sufficient funding. In such a context, adult learning is an important complementary piece, including both private and public provision as well as various forms (formal, non-formal and informal) of learning, each of which requires specific policies and cost-sharing arrangements between government, business and individuals, while continuous updating and possibly adjustment of curricula is another important component. How to spend wisely and efficiently on training and upgrading human capital will in any case be country-specific. Important for assessing and improving the country-specific policy mix could be comprehensive reviews of education sector spending (proven to be an appropriate tool for identifying and eliminating inefficiencies and/or realizing savings). Learning from countries/regions that are seen as similar - i.e. comparing individual solutions against the best practices of other countries/regions - also seems vital. Closing the gap with the best-performing countries (within the EU and for the EU, worldwide) should be the ambitious goal of education policy at EU level (Canton et al., 2018).

REFERENCES

1. Acemoglu D.; Autor, D.H. (2012). What Does Human Capital Do? A Review of Goldin and Katz's The Race between Education and Technology. NBER WP 17820.
2. Aslam, M. (2009). Education gender gaps in Pakistan: Is the labour market to blame? Economic Development and Cultural Change, 57(4), 747–784. https://doi.org/10.1086/598767.
3. Arnhold, N., Bassett, R.M. (2021). Steering Tertiary Education Toward Resilient Systems that Deliver for All, International Bank for Reconstruction and Development / The World Bank.
4. Becker, G.S (1964), Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education. National Bureau of Economic Research. New York: Columbia University Press.
5. Becker, G.S.; Chiswick, B.R. (1966). Education and the distribution of earnings. American Economic Review 56(2): 358–69.
6. Burgess, S. (2016), Human Capital and Education: The State of the Art in the Economics of Education, IZA DP No. 9885, IZA Institute of Labor Economics, Bonn
7. Canton, E., Thum-Thysen, A., Voigt, P. (2018), Economists' Musings on Human Capital Investment: How Efficient is Public Spending on Education in EU Member States? European Commission, Directorate-General for Economic and Financial Affairs, European Economy Discussion Papers 081, June.
8. Chiswick, B. and Hatton, T. (2003) International Migration and the Integration of Labor Markets. University of Chicago Press.
9. Cohn, E., and W. W. Hughes Jr. 1994. "A Benefit-Cost Analysis of Investment in College Education in the United States: 1969-1985." Economics of Education Review 13(2): 109-123.
10. Clements, B. (2002). How efficient is education spending in Europe?. European Review of Economics and Finance. 1. 3-26.
11. De la Fuente, A.; Ciccone, A. (2002): "Human capital in a global and knowledge-based economy". UFAE and IAE Working Paper, 562.03.

12. Denny, K., Harmon C., and Lydon, R. (2002): "Cross-country evidence on the returns to education: Patterns and Explanations". CEPR Discussion Paper,3199.
13. Duflo, E. (2001). Schooling and labor market consequences of school construction in Indonesia: Evidence from an unusual policy experiment. American Economic Review 91(4): 795–813.
14. Fink, G., & Peet, E. (2014). Program on the global demography of aging at Harvard University. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.698.4689&rep= rep1&type=pdf
15. Goldin, C., Katz, L.F. (2008). The Race between Education and Technology. Cambridge MA: Belknap for Harvard University Press
16. Grant, C. (2017), The contribution of education to economic growth, Institute of Development Studies, K4D Helpdesk Report, United Kingdom.
17. Gunderson, M., Oreopoulos, P. (2010). Returns to Education in Developed Countries, pp. 37-43, in Brewer, D.J., McEwan, P.J. (Eds.) Economics of Education, Academic Press, Elsevier.
18. Hanushek, E.; Woessmann, L. (2007a), The Role of School Improvement in Economic Development, NBER Working Paper Series No. 12832, January.
19. Hanushek, E.; Woessmann, L. (2007b). The Role of Education Quality in Economic Growth. World Bank Policy Research Working Paper 4122. https://openknowledge.worldbank.org/bitstream/handle/10986/7154/wps4122.pdf
20. Hanushek, E.; Woessmann, L. (2011). The Economics of International Differences in Educational Achievement, In Handbook of the Economics of Education, Vol. 3, ed. Eric A. Hanushek, S. Machin, and L. Woessmann, Elsevier Publishing.
21. Hauschildt, K., Gwosć, C., Schirmer, H., Wartenbergh-Cras, F. (2021). Social and Economic Conditionsof Student Life in Europe, EUROSTUDENT VII Synopsis of Indicators 2018–2021. Bielefeld: W. Bertelsmann Verlag GmbH & Co. KG.
22. Jula, D., Ailenei, D., Jula, N., Gârbovean, A. (1999). Economia dezvoltării. Editura Viitorul Românesc, București
23. Jula, D., Jula, N.-M. (2019). Econometria seriilor de timp. Editura Mustang, București
24. London Economics. 2005. The Returns to Various Types of Investment in Education and Training Final Report to EC DG EAC, August.
25. Marshall, Alfred (1890). Principles of Economics. Vol. 1 (First ed.). London: Macmillan. Retrieved 2012-12-07.
26. Montenegro, C. (2001). Wage distribution in Chile: Does gender matter? A quantile regression approach. World Bank, Development research group/poverty reduction and economic management network.
27. Montenegro, C.E.; Patrinos, H.A. (2014). Comparable Estimates of Returns to Schooling Around the World. Policy Research WP 7020. http://documents.worldbank.org/curated/en/ 830831468147839247/pdf/WPS7020.pdf
28. Mincer, J. (1974). Schooling, Experience, and Earnings. Columbia University Press for the National Bureau of Economic Research, New York.
29. Mitra, A. 2019, Returns to education in India: Capturing the Heterogeneity, Asia Pac Policy Stud. 2019;6: 151–169.
30. OECD (2016a), PISA 2015 Results (Volume II): Policies and Practices for Successful Schools, PISA, OECD.

31. OECD (2019a), Future of Education and Skills 2030: Reflections on Transformative Competencies 2030, Directorate for Education and Skills, Education Policy Committee, EDU/EDPC(2017)16/ANN5 Revised, 15 April.
32. Patrinos, H.A., Psacharopoulos, G. Tansel, A. (2019). Returns to Investment in Education: The Case of Turkey, ERC Working Papers in Economics 19/03, March.
33. Psacharopoulos, G. (1981). Returns to Education: an updated international comparison. Comparative Education 17(3): 321-341.
34. Psacharopoulos, G. (1994). Returns to Investment in Education: A Global Update, World Bank Working papers no. 1067, pp:1-60.
35. Psacharopoulos, G.; Collis, V.; Patrinos, H.A.; Vegas, E. (2021). The COVID-19 Cost of School Closures in Earnings and Income across the World. Comparative Education Review 65(2): 271-287.
36. Psacharopoulos, G., Patrinos, H.A. (2004). Returns to investment in education: A further update. Education Economics, 12(2), 111-34. https://doi.org/10.1080/0964529042000239140.
37. Psacharopoulos, G. (2006), The Value of Investment in Education: Theory, Evidence, and Policy, Journal of Education Finance, Vol. 32, No. 2, O'Leary Issue (Fall 2006), pp. 113-136, http://www.jstor.org/stable/40704288?origin=JSTOR-pdf
38. Psacharopoulos, G.; Patrinos, H.A.; (2018). Returns to Investment in Education. A Decennial Review of the Global Literature. World Bank, Policy Research Working Paper 8402, https://openknowledge.worldbank.org/bitstream/handle/10986/29672/ WPS8402.pdf?sequence=1&isAllowed=y.
39. Schultz, T.W. (1961a). Education and Economic Growth. In Social Forces Influencing American Education. Chicago: National Society for the Study of Education, 346-388.
40. Schultz, T.W. (1961b). "Investment in human capital." American Economic Review 51(1): 1–17.
41. Smith, Adam (1776). An Inquiry into the Nature and Causes of the Wealth of Nations. Vol. 1 (1 ed.). London: W. Strahan. ISBN 978-1537480787
42. Smidova, Z (2019), Educational outcomes: A literature review of policy drivers from a macroeconomic perspective, OECD Economics Department Working Papers No. 1577.
43. Smidova, Z (2019), Educational outcomes: A literature review of policy drivers from a macroeconomic perspective, OECD Economics Department Working Papers No. 1577
44. St. Aubyn, M., A. Pina, F. Garcia and J. Pais (2009), "Study on the efficiency and effectiveness of public spending on tertiary education", European Commission Economic Papers, No. 390, European Commission
45. Tilak J. B. G., (2003), Education, Society and Development and International Perspectives: National and International Perspectives, University of Michigan.

Characteristics and problems of the education systems in the member states of the European Union

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Abstract: *The education systems in the EU27 member states present different characteristics, these being both the result of specific national historical developments and subject to national laws that govern the field of education (but also other tangential ones: the labour market, youth, the business environment, etc.), but also of the implementation through open coordination mechanisms of the strategies and action programs of the European Union in the field.*

Keywords: education system, higher education system, graduates, member states

JEL Classification: H52, I21, I22, I26

1.Introduction

Although the organizational structures of education systems show great national specificity (see European Commission/EACEA/Eurydice, 2022b), in general compulsory education (including upper secondary level – ISCED 1-3) is completed in all EU27 member states (including in Romania) around the age of 18-19 years (Annex A1). The maximum number of years of schooling expected, from the compulsory access of children to early childhood education units until the completion of university studies varies at the level of the Member States between 15 years in Luxembourg, 16 years in Bulgaria and Malta and 21 years in Sweden and Finland (Eurostat, SYS_EDU_Excel Tables_ AniScolExpect).

However, all the education systems in the EU27 member states[1] are structured on several very well-defined and relatively common organizational levels as well as the duration of the educational processes: pre-primary education (in the case of Romania, nursery school and kindergarten), primary education (in the case of Romania, school primary), lower-level secondary education (in the case of Romania, grammar school), higher-level secondary education (in the case of Romania, high school on the theoretical/vocational/technological streams[2] or vocational school/professional school in the dual system), non- tertiary (in the case of Romania post-secondary school) and tertiary education (in the case of Romania only university education according to the Bologna process (see Annex A2)[3]: bachelor's, master's and doctoral studies, but in other countries there are also short-term university studies) (for Romania, see Annex A3).

The characterization and analysis of education systems can be done from many different

[1] According to specialized studies, at the level of the EU27 member states, three types of educational systems could be identified: that of the Western European states with tradition, that of the states that have British-inspired systems and that of the Central and Eastern European states entered the EU after 2004 (Anghelache et al., 2018).

[2] Cedefop describes Vocational/Vocational and Technical Education (VET) as ‚education and training' which aims to equip people with the knowledge, know-how, skills and/or competences needed in specific occupations or in the wider labor market. It deliberately does not refer to any level or sector of the education and training system (Cedefop, 2020).

[3] Starting in 1999, the so-called Bologna Process was started, which radically changed university-level education at the European level and beyond. The dominant type of higher education at European level is the one structured on three study cycles, according to the Bologna process: bachelor's studies or equivalent, master's studies and doctoral studies. In about half of the countries where this type of higher education is implemented, most graduates of the first cycle of studies continue their studies within the second cycle, but there are large differences between countries in terms of the recognition on the labor market of the qualifications obtained as a result of the graduation of the first cycle of university studies (European Commission, 2018). Regarding the implementation of the Bologna system, the three groups of states with different types of higher education previously mentioned reacted differently: a complementary implementation that did not remove the old forms of academic organization in the case of Western European states with a strong university tradition, a minimal implementation in the case of European states with British-inspired education systems, respectively an effort to implement as precisely as possible the proposed model in the case of the member states from Central and Eastern Europe that joined the EU after 2004 and that had education systems before 1990 strongly centralized (Anghelache et al., 2018).

points of view and by using a variety of indicators and indicator systems (for example, for the EU27 states, the indicators published annually in the Education and Training Monitor, as a component of the reports of progress of the EEA – EU, 2022b). In the case of the present paper, we have chosen a limited number of indicators that, in our opinion, highlight the most important aspects regarding education systems as the main trainers and providers of human capital capable of integrating into modern societies and economies, from the categories "entries into the education systems (pupils and students)", "outputs of the education systems (graduates of secondary, post-secondary and tertiary education)" and "human resources (teachers, educators and trainers) and financial (expenses government) of education systems". The analysis refers to the EU27 member states, in general and to the situation in Romania.

2. Developments of the pupil and student population in the EU27 member states

Pupil and student populations recorded relatively low annual variations overall during the 2013-2021 period, indicating for the time being the maintenance of a relatively constant flow of possible future employees on the EU27 labour markets, but with differences both between member states and on different education levels (Eurostat, SYS_EDU_Excel_Tables_EleviStud_Inscr). However, the increasingly visible impact of the demographic transition regarding the decrease in fertility rates among children enrolled in early childhood education (ECEC) is noted; the average trend at EU27 level was constantly decreasing, even in countries with a large number of immigrants (Germany, France, Spain, Italy). Romania is also facing a sharp demographic decline and the tendency to decrease the number of live births and children (Table 1), but in the case of this form of education there are other factors[4] that make the participation rate in ECEC a of children in Romania between the ages of 3 and the age of starting compulsory education to be one of the lowest in the EU (78.2% compared to the EU average of 93% in 2020 – EC, 2022b). Coupled with the fact that Romania is not a country of immigration but, on the contrary, of emigration, the reduction of entry bases in the education system will have short- and medium-term repercussions on the system itself and in the longer term on the entire economy, through the strong erosion of available human capital.

Table 1. Evolution of the resident population in Romania in the period 2011-2020 by age groups relevant to the national education system (thousands of people)

	2011	2012	2013	2014	2015
Total population	20147.7	20060.2	19988.7	19916.5	19822.3
Age group 0-23 years	5367.8	5281.0	5156.5	5073.9	5031.6
Age group 0-14 years	3190.9	3162.2	3120.6	3094.1	3077.3
Age group 15-18 years	882.5	875.4	868.0	864.7	869.2
Age group 19-23 years	1294.4	1243.4	1167.9	1115.1	1085.1

[4] Lack of adequate infrastructure (nurseries and kindergartens) and its concentration in urban areas, long and favorable duration of parental leave, insufficient offer of childcare and long-term care services - which is also detrimental to women's participation in the market work, especially in rural areas (CE, 2022b).

	2016	2017	2018	2019	2020
Total population	19706.4	19592.9	19483.8	19375.8	19261.7
Age group 0-23 years	4993.3	4956.0	4920.8	4876.5	4844.5
Age group 0-14 years	3063.6	3059.7	3058.1	3037.4	3012.3
Age group 15-18 years	867.1	851.7	835.4	822.1	819.0
Age group 19-23 years	1062.6	1044.6	1027.3	1017.0	1013.2

Source: Ministerul Educației (2022).

The same impact of the aforementioned demographic transition is increasingly visible in the case of the evolution of the number of students enrolled in primary education, both at the EU27 level as a whole and in almost all member states (only Austria and Luxembourg registered positive annual evolutions in all years of the analyzed period - see Eurostat, SYS_EDU_Tabele Excel_ EleviStud_Inscr). Romania registered a tendency to decrease the number of students enrolled in primary education after 2016, more accentuated in the last two years, perhaps as a collateral effect of the Covid-19 pandemic.

The number of pupils enrolled in lower secondary education has registered a tendency of stagnation as an EU27 average, but in many Member States annual variations have been positive almost throughout the 2013-2021 period (Belgium, Czech Republic, Estonia, Ireland, Spain, France, Latvia, Luxembourg, Malta, Austria, Slovenia, Slovakia, Finland and Sweden - Eurostat, SYS_EDU_Tabele Excel_ EleviStud_Inscr). Both demographic developments and some specific ones related to each national education system have favored in these countries the maintenance of a relatively constant flow of entries towards the level of completion of compulsory education and, further, towards higher levels of education that ensure increasing the national human capital. This situation also relates quite well to the level of non-schooling rates of the school-age population corresponding to lower secondary education[5], which, in most of the EU27 member states, is between 0% (Ireland, Croatia, Lithuania and, in recent years, France and Portugal) and around 5% (Hungary) (Eurostat, SYS_EDU_Tabele Excel_RateNescol). The exceptions are Bulgaria and Romania, which during the analysed period recorded constant annual increases in these rates, (Bulgaria from 5.7% in 2015 to 10.4% in 2021 and Romania from 8.6% to 12.2 % in the same interval), simultaneously with the relative stagnation (Bulgaria) or decrease (Romania) of the number of students enrolled in lower secondary education. This highlights an incompletely developed potential national human capital of quite large magnitude (taking into account the low age at which its development stops, at least temporarily, through the education system), which, theoretically, can be re-inserted into the education system and can continue to develop, but which, in practice, is often underutilized compared to the level it could have reached, inducing both the inefficiency of the use of human and material resources of the education systems of the two

[5] Young people who have dropped out of either primary or secondary school for various reasons or who have not even been enrolled in any form of education and who are not yet of legal age to work, but can be trained in household work activities of which they are part or even can be informally employed for various activities that do not require any or a very low level of qualification.

countries (Jula et. al., 1999), but also significant potential losses of income both for the persons concerned throughout their biological life (including in the case of retirement periods) and for the national economies during their working life when the persons generate income that contributes to the national budget[6].

Regarding the trends in the number of students enrolled in upper secondary education, they were fluctuating during the 2013-2021 period in all EU27 member states, but in recent years an increasing trend can be observed, both at the EU27 average level, as well as of some member states (Czech Republic, Denmark, Estonia, Spain, Cyprus, Austria, Romania and Sweden - Eurostat, SYS_EDU_Tabele Excel_ EleviStud_Inscr). The non-schooling rates of the school-age population corresponding to upper secondary education, however, recorded higher and highly differentiated levels between the EU27 member states, even if the average at the EU27 level shows a downward trend in the analysed period (Eurostat, SYS_EDU_Tabele Excel_RateNescol). Relatively high levels of over 10% are recorded at least in certain years in several EU27 countries (Bulgaria, Germany, Croatia, Luxembourg, Hungary, Malta, Romania and Slovakia), as more young people leave education systems, but, at least some of them, do it in order to get a job, even if stopping the education process (possibly temporarily for some) will have negative repercussions on their future incomes, but also on the state's income level. In the case of the two member states that register the highest non-schooling rates of the population of upper secondary education age (both Bulgaria and Romania), the difference compared to the non-schooling rate for the population of lower secondary education age registered a downward trend, which can raise an alarm signal regarding the need for policy interventions, not only educational, but also social, to reduce the extent of the phenomenon of not attending school at relatively young ages (practically, 10-15 years), with all the negative consequences mentioned.

The number of students enrolled in post-secondary higher non-tertiary education recorded annual fluctuations and relative downward trends in the EU27 member states, but also large level differences between them (the largest was accounted for by Germany. Romania recorded a stagnation trend relative). At the same time, the number of students enrolled in secondary education with reduced duration of studies registered a fairly significant upward trend as an EU27 average, but also in most of the member states where this type of tertiary education exists[7] (Eurostat, SYS_EDU_Tabele Excel_EleviStud_Inscr). This situation actually reflects the shift in the interest of students, but also of political decision-makers, towards increasing the level of education in professional/vocational education, which is an increasingly well-documented phenomenon both at the level of the member states (especially those with vocational education systems /vocational education very well developed), but also of the community policy in the field of education and professional/vocational training (Cedefop, 2020).

The number of students enrolled in tertiary education showed an upward trend as an EU27 average over the period 2013-2021 for all forms of education compliant with the Bologna

[6] Aspects that we will present in more detail in another chapter.

[7] In Romania, this type of education was not implemented according to the provisions of the National Education Law of 2011, on the basis of which the higher education system operated until 2023, but it is to be introduced in accordance with the provisions of the new Higher Education Law adopted in 2023.

Process: bachelor's, master's and doctoral studies, which overall contributed upon reaching the target provided by the Europe 2020 Strategy for the population with tertiary education[8]. However, there were also trends of decrease in the number of students enrolled in the three types of tertiary education, especially in the Baltic states (in Estonia and Latvia for all three forms of education and in Lithuania for undergraduate studies and those for master's), in the Czech Republic (for all forms of studies, except for the last years), in Poland and Slovenia (for bachelor's and master's studies), in Austria (for master's and doctoral studies), in Finland (for master's studies bachelor and doctoral), in France (for doctoral studies). Romania also recorded annual reductions in the number of students for all forms of studies until 2016-2017, followed by increases until the end of the analysed period, the most significant being recorded in the case of doctoral studies (which, however, had registered a sharp downward trend of the number of students enrolled at the beginning of the period).

3. Evolutions of the population of graduates of the education systems of the EU27 countries able to start their professional activity

The evolutions of the number of graduates of upper secondary education in the period 2013-2021 largely reflect those of the number of students enrolled in this form of education, with differences between member states (Eurostat, SYS_EDU_Excel Tables_ Graduates), determined by the characteristics of national education systems (duration of studies, way of completion through exams, changes in the structure of education systems, etc.). Most of the Member States recorded intra-period annual fluctuations or downward trends, but in the last two years (the years of the Covid-19 pandemic) an upward trend in the number of upper secondary education graduates can still be noted. In the case of the two forms of studies, respectively with a general study program and with a professional/vocational study program, the differences in the rate of evolution of the number of graduates were very heterogeneous in the analysed period and, in general, against the study form with professional/vocational program. The ratio between the number of graduates and the number of students enrolled in upper secondary education[9], in total and for both types

[8] It should be mentioned here that one of the most important factors documented at the international level and by the EU member states regarding the choice to continue education at tertiary level is the one related to the education level of the students' parents. The correlation between the tertiary education level of the parents and the number of students enrolled in undergraduate study programs is high in the EU27 states – 0.87 in 2018 (European Commission/EACEA/Eurydice, 2020a) and as the tertiary education level of the population Romania's is the lowest compared to the rest of the member states, Romania's recovery of the gap in the field of higher education will not be a quick process, even if more substantial progress has been registered in recent years.

[9] Existing in the respective education system in a given year. Since no data were available on actual graduation rates through official exams or certifications, we used this very rough estimate of completion for each educational level analyzed. We believe that values relatively close to the number of years of actual schooling for each form of education may indicate a relatively constant flow of possible new employees on the labor market or of possible new learners in further and/or higher forms of education and training, but also smaller gaps regarding the duration of completing the studies.

of study programs, varies significantly at the level of the EU27 member states (between approx. 1 graduate for 6 students enrolled in the respective year in Belgium and Sweden and 1 graduate for 2 students enrolled in Malta - Eurostat, SYS_EDU_Excel Tables_ Graduates), reflecting, among other things, the particularities of this form of education in each member state and intra-period developments produced at the level of national education systems. Another important observation in the case of secondary education is the share of graduates who continue their studies at the tertiary education level. The available data on the share of initial professional/vocational education graduates continuing their studies at tertiary level (Annex A4) indicate an increasing trend in the period 2015-2021, both as an EU27 average and in most member states (except for France and Sweden), but with important differences between the member states, going from below 20% in Lithuania to over 55% in Slovenia (except in 2021, Romania registered in the analysed period weights between 45% and almost 50 % and strong upward trend).

As regards the annual dynamics of the number of non-tertiary post-secondary education graduates (Eurostat, SYS_EDU_Excel Tables_ Graduates), it recorded rather large intra-period annual oscillations at the level of all Member States and divergent trends of evolution, reflecting both the particularities of the of the organization of this form of education in each member state (public or private providers of education and training services, strict or less strict regulation of the way of operation, fields of study, ways of certifying the completion of studies, etc.), as well as the previously mentioned trend, increasingly common at the level of professional/vocational education in the EU27 countries, of moving towards obtaining higher-level professional qualifications[10], which require tertiary-level studies (with a reduced study program, mainly). The ratio between the number of enrolled students and the number of graduates varies widely between EU27 member states (from less than 1 graduate for 1 enrolled student in Malta, to over 7 in Greece). In the case of Romania, the ratio is approx. 1 graduate for 3 students enrolled in the same year.

In the case of tertiary level education, the total number of graduates registered almost constant annual increases during the period 2013-2021 in Belgium, Ireland, France, Cyprus, Malta, Finland and Sweden (Romania registered annual increases only after 2018), but in different years of the period most member states had increases (Eurostat, SYS_EDU_Excel Tables_ Graduates). The number of bachelor's degree graduates mostly registered annual increases in countries such as Spain, Italy, France, Luxembourg, the Netherlands, Austria, Portugal, Finland and Sweden (Romania registered increases in the number of graduates only in the period 2018-2021), while the number of master's degree graduates recorded mostly upward developments in Belgium, Denmark, Germany, Ireland, Greece, France, Italy, Cyprus, Luxembourg, Malta, the Netherlands, Finland and Sweden), in the rest of the Member States registering either more significant intra-period oscillations (as in the case of Romania) or mostly downward trends (Jula and Jula, 2019). However, the biggest variations in the number of graduates were registered in the case of doctoral studies, both as an average of the EU27 and at the level of almost all member states, a situation

[10] A notable change is the emergence and increased visibility of so-called „VET at higher levels" within levels 5-8 of the European Qualifications Framework (EQF). Many Member States have seen a significant increase in VET at EQF level 5 and the extension of VET at levels 6 to 8 (Cedefop, 2020).

which is not unusual, due to the national and institutional peculiarities regarding the organization, financing, undertaking and completing this type of tertiary education. However, the ratio between the number of students and the number of graduates varies according to the type of tertiary education[11]. Thus, in the case of undergraduate studies, the ratio is higher, varying in the analysed period from 1 graduate for 11-14 enrolled students in the case of Greece to 1 graduate for approx. 3 enrolled students in the case of Malta (Romania, like many other member states, recorded values of 1 graduate for 4-5 enrolled students, close to the EU27 average). The differences are more attenuated between the member states in the case of master's studies (varying between 1 graduate for 5 existing students in the system in the case of Germany and Sweden and less than 2 students for one graduate in the case of Ireland. Romania also recorded a level close to the EU27 average, of 1 graduate for 3 existing students in the system), but are most significant and heterogeneous at the level of the Member States in the case of doctoral studies (ranging from 1 graduate for more than 15 existing students at a given time in the system in Greece and 1 graduate for over 10 students in the Czech Republic, Estonia, Cyprus, Latvia, Poland, and Finland to approx. 1 graduate for approx. 3 students in the Netherlands).

4. Characteristics of human resources in the education systems of the EU27 member states

All over the world, teachers are a vital driving force in student learning. The Council of Europe conclusions on European teachers and trainers for the future underline that teachers have a substantial influence on student achievement. They play an essential role in supporting young people to develop their knowledge, skills and values and in supporting them to reach their full potential, both as students and as future citizens "Teachers and trainers have the responsibility to facilitate learners' acquisition of key skills and professional competences" and to "promote their social responsibility and civic engagement, to transmit human values, as well as to support their growth and personal well-being". (Council of Europe, 2020a). The existence of a quality teaching staff is one of the cornerstones of a successful educational system, where students from different backgrounds can feel inspired and motivated and can adapt to a rapidly changing world. Although the professional quality of teachers is not the only factor that can ensure the success of an educational system, this objective cannot be achieved without considering this aspect. Also, the outbreak of the COVID-19 pandemic and the rapid transition from face-to-face to distance learning have highlighted the important role of teachers in ensuring equal access of all students to quality education (Council of Europe, 2020b). According to the Communication of

[11]According to international studies, lower rates of completion of university studies do not necessarily indicate the inefficiency of a tertiary education system, since there are a multitude of factors that can cause the abandonment of studies or the postponement of the period of their completion by obtaining a diploma or certification (the desire to change the field of study, attractive employment opportunities before completing the studies, with or without continuing them in the same form of studies or in an equivalent form with reduced frequency or even without frequency, individual interest only in acquiring certain knowledge provided by the study program, the socio-economic and educational background of the students, the gender, the personal context related to immigration or not, either individual or family, etc. (OECD, 2019).

the European Commission regarding the achievement of the European Education Area by 2025 (24), "teachers, trainers and teaching staff are at the center of the educational process [...] and play the most important role in transforming education into a fruitful experience for all learners' (European Commission/EACEA/Eurydice, 2022).

Across Europe, education systems are facing a professional crisis in the teaching profession. Many European education systems are currently suffering from a shortage of teaching staff. This situation is highlighted, among other indicators, by the one related to the ratio of pupils/students per teacher[12], although there are other factors that influence its level (first of all, the system of organizing educational processes established by national legislation on education, on levels of education, regional/local regulations regarding the organization of educational institutions, if they exist, etc.). in the case of the EU27 member states, its level differs according to the level of education and varies greatly between member states for each individual level. Thus, in the case of pre-primary education, the tendency of its level at the EU27 level was to decrease in the period 2013-2021, as in the vast majority of member states, with few exceptions [Slovenia, Sweden – cf. Eurostat, tables Educ_uoe_perp04]. With two exceptions (France and Slovenia), the level differences between Member States are not very large, ranging in 2021 between less than 10 children per teacher/educator in Finland, Germany, Greece, and Luxembourg and almost 16 in the Netherlands and Portugal. Romania also registered a downward trend in the number of children that come under the care of an educator during the analysed period, from almost 17 in 2013 to approx. 14 in 2021, but it is still above the European average in this regard. In the case of primary and lower secondary education [cf. Eurostat, tables Educ_uoe_perp04], the tendency was also to decrease the student/teacher ratio at the EU27 level in the period 2013-2021, but less, and the level differences between the member states were also smaller, going from over 16 students for one teacher in the case of France and the Netherlands to 8 in the case of Greece. Romania recorded values above the EU27 average, but with a downward trend especially towards the end of the analysed period, up to approx. 14 students per teacher. The downward trends of the student/teacher ratio are also registered in the case of upper secondary level education, both in the case of the general study program and the vocational/professional one [cf. Eurostat, tables Educ_uoe_perp04], but the disparities between Member States are different in magnitude for the two forms of education. Thus, in the case of the general study program, the level differences vary between 16 students per teacher in the Netherlands and approx. 9 in Cyprus and an EU27 average of approx. 12 students per teacher, while in the case of vocational/vocational studies the level differences vary between 18-19 students per teacher in Estonia, Finland and the Netherlands and around 8 students per teacher in Belgium, Greece, Spain and France and an EU27 average of 10 pupils per teacher. In both cases, Romania registered levels of the student/teacher ratio above the EU27 average, of 15 and 13 students per teacher, respectively. Finally, the largest differences between Member States in terms of the ratio of pupils/students per teacher are recorded in the case of tertiary education [Eurostat, tables Educ_uoe_perp04], from over 40 in Greece and over 20 in Italy, Cyprus and Romania, at below 5 in Luxembourg and around 10 in Malta and Sweden.

[12] As we have seen in other chapters, it is used to highlight the quality of education and in studies that estimate the impact of education on economic and human growth/development. Its importance is considered to be particularly important for pre-tertiary levels of education.

The shortage of teaching staff (especially its chronicity) can significantly hinder the provision of quality services in the fields of teaching and learning. The deficit may even be exacerbated by the accentuated imbalances regarding the distribution of teaching staff by discipline and geographical area, by an aging teaching population, marked by professional abandonment and low enrolment rates in initial teacher training programs. There are many reasons why the teaching profession has become less attractive today than it was decades ago. In many European countries, the teaching profession is perceived as having a low value and the teaching status also has a low social value (European Commission, 2019; OECD, 2020a). Thus, according to the most recent data provided by the TALIS Questionnaire[13] (at the level of 2018), only in Finland the share of teachers in lower secondary education who considered that the teaching profession is valued by society was close to 60% and in Romania it exceeded 40%, while whereas in countries such as France, Slovenia, Slovakia and Croatia the level of appreciation was very low (below 10% - Table 2).

In addition, as the Council of the European Union points out, constant changes in social, demographic, cultural, economic, scientific, environmental, and technological areas affect the world of education and training. In this context, teachers and trainers face increasing requirements, responsibilities and expectations, and these have an effect on the skills required of them, but also on their well-being and on the attractiveness of the teaching profession, in general (Council of Europe, 2020a). However, the share of teachers who stated according to TALIS that their first career choice was teaching is not lower than 50% in any EU27 member state, exceeding 80% in Portugal and Slovenia (see Table 2). And in Romania this share was quite high, almost 75%). However, it is very true that many education systems in the EU27 states and not only face several challenges at the same time, requesting policies that restore or increase the attractiveness of teaching as an option for those who aim to build a career. Governments across Europe are implementing plans to address the high attrition that can occur in the teaching profession, and these often go in the direction of reshaping initial teacher training, improving working conditions, reforming career paths and modernizing continuing professional development (European Commission/EACEA/Eurydice, 2022).

In addition to the shortage of teaching staff, another increasingly acute problem of the education systems in Europe, in general and in the EU27 member states is the phenomenon of the aging of teaching staff. The most recent Eurostat data (Figure 1) indicates that, at EU level, almost 40% of lower secondary teachers are at least 50 years old, and less than 20% are under 35 years old. In some countries (Estonia, Greece, Italy, Latvia, and Lithuania), over half of lower secondary teachers will retire in the next 15 years. In Bulgaria, Germany, Hungary, Austria and Portugal, the share of this age group is between 40% and 50%. The average age of teachers is also relatively high in many EU27 member states, exceeding 45 years in most of them (Table 2), this not always being correlated with a greater number of years of experience (Denmark, Finland, Italy, Spain and Sweden), for reasons related to the specifics of each national education system. In 2018, Romania registered an average age of teachers in lower secondary education of 43.0 years and a number of 17.3 years of professional experience.

[13] Teaching and Learning International Survey, OECD (202a).

Table 2. TALIS results for 2018 regarding the situation of teaching staff in European Union countries

	Teachers who...				Teachers for whom the teaching career was the first career choice, %	Female teaching staff	Average age of teachers	Average number of years of teaching career experience	Share of teachers over 50, %
	agree or strongly agree with the statement that the teaching profession is valued by society, %	are satisfied with …		apart from the salary, they are satisfied with the terms of the employment contract, %					
		their workplace, %	the salary they receive for the work performed, %						
Austria	16.1	96.5	69.9	85.0	65.9	70.5	44.9	18.2	43.8
Belgium	16.3	89.2	64.6	70.5	68.3	69.5	39.6	15.4	21.9
Belgium - Flanders	25.8	92.9	73.1	67.1	73.6	70.2	39.4	15.9	22.0
Belgium - Wallonia	5.3	84.8	54.8	74.4	62.2	68.7	39.8	14.7	21.8
Bulgaria	17.7	92.4	29.5	72.9	71.9	79.5	48.9	21.6	51.0
Croatia	9.2	90.6	25.0	51.0	66.7	78.2	42.1	14.7	24.3
Czechia	16.0	89.6	28.0	74.8	68.0	76.4	45.1	18.1	37.1
Denmark	18.5	89.2	68.0	37.2	61.9	60.1	44.4	15.4	32.7
Estonia	26.4	94.2	39.1	82.1	64.6	83.8	49.1	22.7	53.7
Finland	58.2	88.0	45.3	72.1	59.3	69.8	44.8	16.0	35.3
France	6.6	84.7	28.7	79.6	69.2	65.3	43.0	16.9	27.2
Hungary	11.8	88.1	27.5	39.6	78.9	79.1	47.6	20.7	47.7
Italy	12.1	95.9	20.8	58.9	65.3	78.1	48.6	17.9	48.4
Latvia	23.3	90.6	22.0	81.4	73.9	89.2	48.4	23.7	51.2
Lithuania	14.1	82.7	11.1	77.3	79.9	84.9	49.9	24.7	56.7
Malta	14.5	84.6	17.9	55.5	69.4	69.7	36.8	12.7	12.2
Netherlands	30.7	93.9	58.0	68.4	53.4	53.2	42.9	16.2	32.2

	Teachers who...								
	agree or strongly agree with the statement that the teaching profession is valued by society, %	are satisfied with …		apart from the salary, they are satisfied with the terms of the employment contract, %	Teachers for whom the teaching career was the first career choice, %	Female teaching staff	Average age of teachers	Average number of years of teaching career experience	Share of teachers over 50, %
		their workplace, %	the salary they receive for the work performed, %						
Portugal	9.1	92.1	9.4	29.0	84.2	73.7	48.7	23.1	46.9
Romania	40.9	93.7	23.3	73.7	74.6	73.0	43.0	17.3	26.2
Slovakia	4.5	88.5	17.9	80.4	63.8	82.1	44.4	17.8	33.0
Slovenia	5.6	89.8	31.8	76.5	81.7	79.0	45.8	20.0	39.0
Spain	14.1	95.7	50.2	61.5	61.8	61.8	45.6	17.1	36.4
Sweden	10.7	90.3	34.8	67.1	59.1	65.8	45.7	15.7	36.0

Source : Processing by the author based on data taken from the OECD.

The combination of the aging of the teaching population and the current shortage indicates that the challenge of recruiting teachers in certain fields and/or geographical areas (STEM (Science, Technology, Engineering and Mathematics) and ICT and in remote or disadvantaged areas – see European Commission, 2022) could become even worse in the coming years, especially if the system fails to attract new students and, above all, to retain in the education systems the graduates of specialized studies in the field of education (Council of Europe, 2020a).

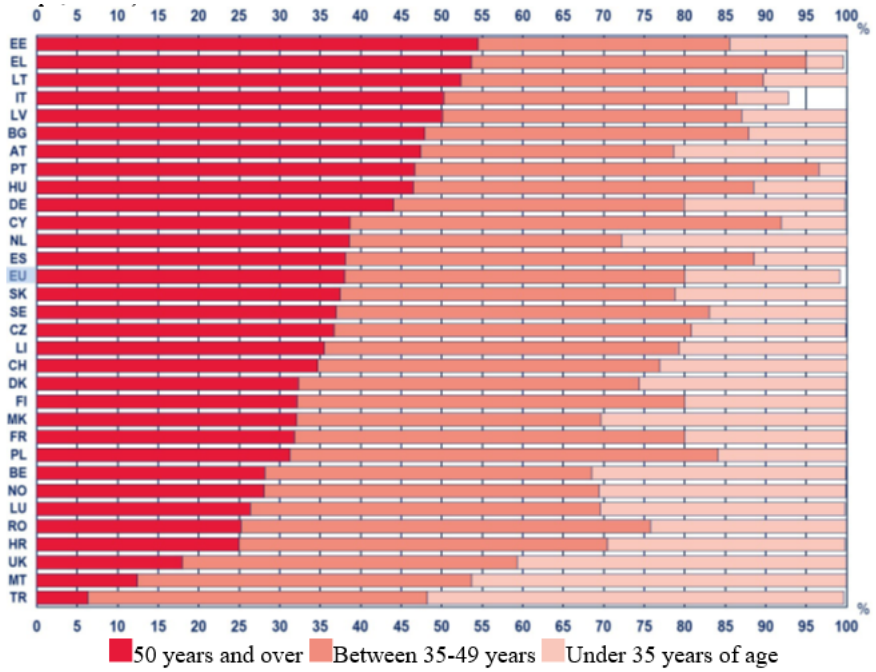
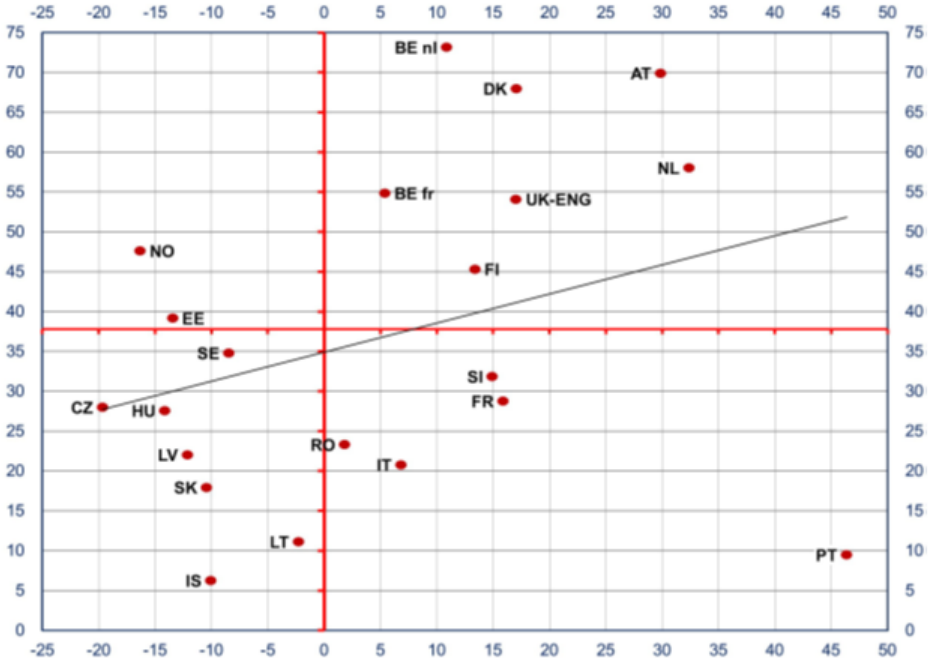


Figure 1 . The proportion of teachers in lower secondary education by age group, in 2018
Source : European Commission/EACEA/Eurydice (2022).

Conclusion

The Council of Europe conclusions on European teachers and trainers for the future (Council of Europe, 2020a), underline that investing in quality education also means investing in teachers and trainers, and this includes adequate salaries. Similarly, the Education and Training Monitor (European Commission, 2019) points out that "competitive teachers' salaries are considered essential for increasing the quality of the teaching workforce". However, teachers often earn less than other categories of workers in tertiary education (European Commission/EACEA/Eurydice, 2019). Teacher salaries vary enormously across Europe, as does teacher satisfaction with the income they earn. At EU level, less than 40% of teachers are satisfied or very satisfied with the salary they receive. The TALIS 2018 questionnaire (OECD, 2020a) gave teachers the opportunity to express their satisfaction with the salaries they receive. The analysis of teachers' responses shows that, overall, at the EU level, only 37.8% of teachers consider their salary satisfactory or very satisfactory, with many countries presenting percentages below 30% (Figure 2). Less than 1 in 10 teachers say they are satisfied with the salary they receive in Iceland and Portugal. By comparison, around 70% of teachers in Austria and Belgium (Flemish Community) say they are satisfied or very satisfied with their salaries.

Romania presented a rather low level of teacher satisfaction in terms of salary level, at 23.3% (European Commission/EACEA/Eurydice, 2022).



Legend: X-axis = % difference between the average gross real annual salary (EUR) and GDP.
Y-axis = % of teachers who are satisfied with their salary. AT = Austria; BE nl – Belgium – Flanders; BE fr – Belgium – Wallonia; CZ = Czech Republic; DK = Denmark; EE = Estonia, FI = Finland; FR = France; HU = Hungary; IS = Iceland; IT = Italy, LV = Latvia; LT = Lithuania; NL = The Netherlands; NO = Norway; PT = Portugal; RO = Romania; SE = Sweden; SI = Slovenia; SK = Slovakia; UK-ENG = United Kingdom – England.

Figure 2. Share of teachers satisfied with their salaries and the difference between average real gross annual teacher salaries (EUR) and GDP per capita, lower secondary education, 2018/19

Source: European Commission/EACEA/Eurydice (2022).

In many countries, where the average real gross salary of teachers is below the national GDP per capita, teachers express low satisfaction with their income. The opposite is also true. Teachers in countries where average salaries exceed GDP per capita express higher satisfaction with their salaries. However, the percentage variation between the average gross annual salary of teachers and GDP per capita fluctuates substantially between countries. While in the Netherlands the average salary is almost 25% higher than GDP per capita, in the Czech Republic it is almost 25% lower. It should be noted that in all Eastern European countries indicated in the figure, wages are lower than GDP per capita, except for Slovenia and Romania. However, according to the TALIS results, it is not the level of salaries that is the main determinant of the choice of a teaching career, but salary policies must take into account the negative correlations between the level of salary and that of the value for society and the propensity of young graduates, but also of other professionals, to choose a teaching career. The data show that other specific circumstances may also play a role in teachers' dissatisfaction with their pay, such as slow and/or modest salary progression over the course of their careers or long periods of stagnation due to government investment lower in public interest expenses. Considering the rate of evolution of salaries, as well

as the general level of salaries, the rethinking of salary policies could contribute to improving the degree of satisfaction of teaching staff regarding the salaries they receive. Also, increasing the attractiveness of teachers' salaries could play an important role in influencing young people to choose this professional option (European Commission/EACEA/Eurydice, 2022).

REFERENCES:

1. Anghelache, C., Petrescu, I., Anghel, M.G., Gogu, E. (2018), Evoluția centenară a învățământului în România, Editura Economică, București.
2. Comisia Europeană/EACEA/Eurydice (2022a). Cadrele didactice din Europa: Cariere, dezvoltare şi stare de bine. Raport Eurydice. Luxemburg: Oficiul pentru Publicaţii al Uniunii Europene.
3. Comisia Europeană/EACEA/Eurydice (2022b). Structura sistemelor europene de învățământ, 2022/2023: Diagrame schematice. Date și cifre. Eurydice. Luxemburg: Oficiul pentru Publicații al Uniunii Europene.
4. Comisia Europeană (2019). Monitorul Educației și Formării 2019. Luxemburg: Biroul de publicații al Uniunii Europene.
5. Cedefop (2020a). Vocational education and training in Europe, 1995-2035: scenarios for European vocational education and training in the 21st century. Luxembourg: Publications Office of the European Union. Cedefop reference series; No 114.
6. Cedefop (2020b). Perceptions on adult learning and continuing vocational education and training in Europe: second opinion survey. Volume 1: Member States. Luxembourg: Publications Office.
7. Consiliul Europei (2020a). Concluziile Consiliului din 26 mai 2020 privind profesorii și formatorii europeni pentru viitor, JO C 193, 9.6.2020.
8. Consiliul Europei (2020b). Concluziile Consiliului din 16 iunie 2020 privind combaterea crizei provocate de pandemia de COVID-19 în educație și formare, JO C 212
9. Jula, D., Ailenei, D., Jula, N., Gârbovean, A. (1999). Economia dezvoltării. Editura Viitorul Românesc, București
10. Jula, D., Jula, N.-M. (2019). Econometria seriilor de timp. Editura Mustang, București
11. Legea nr.1/5.01. 2011, Legea Educației Naționale.
12. Ministerul Educației. 2022. Raport privind starea învățământului preuniversitar din România 2020 – 2021.
13. OECD (2019a), Future of Education and Skills 2030: Reflections on Transformative Competencies 2030, Directorate for Education and Skills, Education Policy Committee, EDU/EDPC(2017)16/ANN5 Revised, 15 April.
14. OECD (2019b), OECD Future of Education and Skills 2030, OECD Learning Compass 2030 A Series of Concept Notes.
15. OECD (2019c), PISA 2018 Results (Volume I): What Students Know and Can Do, PISA, OECD Publishing, Paris, https://doi.org/10.1787/5f07c754-en.
16. OECD (2019d), PISA 2018 Results (Volume II): Where All Students Can Succeed, PISA, OECD Publishing, Paris, https://doi.org/10.1787/b5fd1b8f-en.

17. OECD (2019e). TALIS 2018 Rezultate (Volumul I): Profesorii și liderii școlilor ca formabili pe parcursul întregii vieți. Paris: Publicațiile OECD.
18. OECD (2019f). Trends shaping education, Paris: OECD Publishing.
19. OECD (2020). TALIS 2018 Rezultate (Volumul II). Profesorii și liderii școlilor ca profesioniști valoroși. Paris: Publicațiile OECD.

Annexes

Annex A1. Characteristics of education systems in European countries, 2019

(a) Organizational structure of education systems

	Compulsory education		Free education		The official age for starting primary educ.	Duration of education (years)				School age population (thousands)				Enrolment in the education system (thousands)			
	1 year of pre-primary educ.	9 years of primary-secondary education	1 year of pre-primary educ.	12 years of primary-secondary education		pre primary	primary	secondary cycle		pre-primary	primary	second.	tertiary	pre-primary	primary	second.	tertiary
								lower	high								
SDG indicator	4.2.5	4.1.7	4.2.5	4.1.7													
Region	% of all countries					Median values				Cumulative values							
Total World	23	74	50	53	6	3	6	3	3	352000	728000	791000	586000	217000	739000	601000	228000
Europe*	28	93	68	70	6	3	5	4	3	26000	40000	55000	40000	24000	41000	58000	29000
	Number of years									Thousands of people				Thousands of people			
Albania	-	11	3	12	6	3	5	4	3	104	162	257	233	79	167	256	139
Andorra	-	11	-	10	6	3	6	4	2	…	…	…	…	2	4	5	1
Armenia	-	12	3	12	6	3	4	5	3	129	170	295	179	51	154	249	92
Austria	1	12	1	12	6	3	4	4	4	258	336	690	496	257	339	687	430
Azerbaijan	1	9	5	11	6	3	4	5	3	503	659	1021	695	207	645	967	218
Belarus	-	9	-	11	6	3	4	5	2	364	456	657	445	349	428	649	389
Belgium	-	12	3	12	6	3	6	2	4	393	806	775	653	450	821	1179	516
Bosnia-Herzegovina	-	9	-	9	6	3	5	4	4	90	…	…	221	23	157	240	89
Bulgaria	2	9	4	12	7	4	4	4	4	258	291	537	330	221	263	490	236
Cyprus	1	9	1	12	6	3	6	3	3	28	58	55	58	25	57	55	47
Croatia	-	8	-	8	7	4	4	4	4	157	169	323	244	115	162	332	165
Czechia	-	9	-	13	6	3	5	4	4	325	572	826	516	366	584	787	329
Denmark	-	10	-	10	6	3	7	3	3	173	452	405	383	178	468	531	311
Estonia	-	9	4	12	7	4	6	3	3	58	92	77	65	55	88	84	46
Finland	1	9	1	12	7	4	6	3	3	237	373	356	326	208	369	546	295
France	-	10	3	12	6	3	5	4	3	2356	4166	5840	3872	2543	4302	6110	2619
Georgia	-	9	-	12	6	3	6	3	3	173	327	271	237	…	317	283	151
Germany	-	13	-	13	6	3	4	6	3	2306	2982	7082	4447	2359	2987	6949	3128
Greece	1	9	2	12	6	2	6	3	3	177	619	641	537	152	643	668	767
Hungary	3	10	3	12	7	4	4	4	4	353	374	778	563	311	374	809	283
Iceland	-	10	…	…	6	3	7	3	4	13	33	30	24	13	32	35	18
Israel	3	12	3	12	6	3	6	3	3	508	938	823	609	548	936	837	374

	Compulsory education		Free education		The official age for starting primary educ.	Duration of education (years)				School age population (thousands)				Enrolment in the education system (thousands)			
	1 year of pre-primary educ.	9 years of primary-secondary education	1 year of pre-primary educ.	12 years of primary-secondary education		pre primary	primary	secondary cycle		pre-primary	primary	second.	tertiary	pre-primary	primary	second.	tertiary
								lower	high								
Ireland	-	10	…	…	5	2	8	3	2	128	563	323	299	123	564	492	231
Italy	-	12	-	8	6	3	5	3	5	1527	2768	4594	2949	1491	2871	4630	1896
Latvia	2	9	6	12	7	4	6	3	3	85	121	109	88	77	122	117	82
Liechtenstein	1	8	…	…	7	2	5	4	3	1	2	3	2	1	2	3	1
Lithuania	-	10	-	12	7	4	4	6	2	118	114	209	160	103	117	233	118
Luxemburg	2	10	3	13	6	3	6	3	4	20	38	47	38	18	38	49	7
Malta	-	11	2	13	5	2	6	3	4	9	25	28	25	10	27	31	16
Monaco	-	11	3	12	6	3	5	4	3	…	…	…	…	1	2	3	1
Montenegro	-	9	-	9	6	3	5	4	4	22	38	63	42	16	39	57	23
Netherlands	1	12	2	12	6	3	6	3	3	528	1093	1195	1021	475	1175	1632	890
North Macedonia	-	13	-	13	6	3	5	4	4	70	114	189	139	29	110	156	60
Norway	-	10	-	10	6	3	7	3	3	184	446	383	348	180	447	449	289
Poland	1	9	4	12	7	4	6	3	3	1493	2383	2117	2176	1361	2277	2392	1493
Portugal	-	12	2	12	6	3	6	3	3	253	559	620	543	240	622	767	356
Rep. Moldova	-	11	4	12	7	4	4	5	2	152	156	260	208	133	140	224	81
Romania	-	10	3	13	6	3	5	4	4	554	1030	1650	1056	521	948	1458	539
Russian Fed.	-	11	4	11	7	4	4	5	2	7632	7059	10490	6827	6387	6928	10242	5775
San Marino	-	10	-	13	6	3	5	3	5	1	2	2	2	1	2	2	1
Serbia	-	8	-	12	7	4	4	4	4	263	265	560	368	168	264	529	250
Slovakia	-	10	1	13	6	3	4	5	4	169	228	488	318	166	229	442	144
Slovenia	-	9	-	13	6	3	6	3	4	65	130	132	99	61	129	147	77
Spain	-	10	3	10	6	3	6	3	3	1259	2909	2782	2252	1296	3043	3371	2052
Sweden	1	9	1	12	7	4	6	3	3	473	610	651	595	463	893	935	431
Switzerland	2	9	2	9	7	2	6	3	4	174	497	591	500	174	515	609	307
Turkey	-	12	3	12	6	3	4	4	4	4100	5469	10854	6678	1501	5105	11280	7560
Ukraine	-	11	-	11	6	3	4	5	2	…	…	…	…	1094	1725	2445	1602
United Kingdom	-	11	2	13	5	2	6	3	4	1633	4921	5249	4019	1765	4893	6174	2467

*Without Armenia, Azerbaijan, Cyprus, Georgia, Israel, Turkey.

Source : GEM 2021/2022, UNESCO (2022).

(b) Targets related to the achievement of SDG 4 – the situation of European countries in 2019

	Target 4.3 Technical, vocational, tertiary, and adult education						Target 4.4 – Skills for the labour market						
	Participation in adult education and training (%)	% young people enrolled in TVET	Share (%) of TVET in		Gross graduation rate in tertiary education (%)	Tertiary Gross Enrolment Rate (GER) (%)	% of adults over 15 with ICT skills, regarding:			% of adults over 25 with at least an education level of:			
			secondary education enrolments	post-secondary non-tertiary education			Copy and modify documents	Using formulas in spreadsheets	Writing programs for computers	Primary	Secondary - lower cycle	Secondary - upper cycle	Tertiary
SDG indicator	4.3.1	4.3.3				4.3.2		4.4.1			4.4.3		
Total World	…	5	10	…	…	39	33	16	4	84	70	57	26
Europe*	…	18	23	…	…	73	46	34	5	98	88	71	30
Albania	9	5	8	…	43	60	13	7	2	…	…	…	…
Andorra	…	…	10	100	…	…	…	…	6	97	72	47	32
Armenia	…	8	8	…	44	51	…	…	…	99	97	90	47
Austria	60	28	34	100	35	87	63	46	9	…	…	80	31
Azerbaijan	…	15	15	100	21	32	64	21	1	98	96	89	30
Belarus	…	10	13	100	…	87	41	20	2	…	…	…	…
Belgium	45	25	43	93	50	79	65	45	4	96	87	69	36
Bosnia-Herzegovina	9	22	38	…	31	40	22	8	2	88	81	64	12
Bulgaria	25	17	33	100	48	72	…	…	1	…	95	76	25
CYPRUS	48	7	9	…	25	81	45	28	4	96	82	73	39
Croatia	32	22	38	…	44	68	54	43	9	…	…	…	…
Czechia	46	26	35	36	43	64	56	45	6	100	100	91	21
Denmark	50	12	21	…	56	81	68	54	14	…	94	79	37
Estonia	44	12	23	100	45	70	55	44	7	…	…	88	40
Finland	54	20	48	100	58	90	69	49	9	…	…	76	36
France	51	19	18	55	47	68	…	…	6	98	84	70	30
Georgia	2	3	5	100	35	64	33	11	1	99	98	92	59
Germany	52	21	19	93	41	70	57	35	5	100	96	83	36
Greece	17	13	15	100	45	143	52	38	4	91	65	55	27
Hungary	56	18	20	100	33	50	53	37	4	100	97	76	29
Iceland	…	9	18	99	51	73	82	71	13	…	…	…	…
Israel	53	17	20	…	…	61	…	…	…	96	89	81	47
Ireland	…	8	27	100	…	77	53	36	6	…	86	71	43
Italy	42	21	33	100	40	64	42	31	4	95	78	49	15
Latvia	48	17	20	100	49	93	53	32	3	…	100	90	44

	Target 4.3 Technical, vocational, tertiary, and adult education						Target 4.4 – Skills for the labour market						
	Participation in adult education and training (%)	% young people enrolled in TVET	Share (%) of TVET in		Gross graduation rate in tertiary education (%)	Tertiary Gross Enrolment Rate (GER) (%)	% of adults over 15 with ICT skills, regarding:			% of adults over 25 with at least an education level of:			
			secondary education enrolments	post-secondary non-tertiary education			Copy and modify documents	Using formulas in spreadsheets	Writing programs for computers	Primary	Secondary - lower cycle	Secondary - upper cycle	Tertiary
Liechtenstein	…	23	34	…	14	38	…	…	…	…	…	…	…
Lithuania	28	9	9	100	62	74	45	42	5	99	96	87	55
Luxembourg	48	22	33	100	8	19	82	69	11	…	…	69	…
Malta	36	10	16	…	45	65	50	41	8	99	82	45	30
Monk	…	…	11	100	…	…	…	…	…	…	…	…	…
Montenegro	…	23	34	…	36	54	…	28	4	…	…	…	…
Netherlands	64	23	37	…	52	87	72	54	9	99	90	71	33
North Macedonia	13	…	28	100	27	43	32	21	3	…	…	…	…
Norway	60	17	28	100	55	83	78	60	11	100	99	78	40
Poland	26	20	28	100	45	69	34	28	4	99	85	85	28
Portugal	46	16	24	100	51	66	47	37	8	92	54	37	19
Rep. Moldova	…	10	13	100	34	39	…	…	…	99	97	75	…
Romania	7	…	28	100	38	51	22	15	1	99	91	67	18
Russian Fed.	…	18	14	100	58	85	27	24	1	…	…	…	…
San Marino	…	3	7	…	33	51	…	…	…	97	83	54	16
bondage	20	25	35	100	…	68	34	24	4	98	90	72	23
Slovakia	46	23	30	100	35	45	…	35	4	100	99	87	23
Slovenia	46	35	45	…	48	77	…	42	5	100	98	83	28
Spain	43	15	19	100	43	91	52	38	7	92	78	50	31
Sweden	64	13	21	76	40	72	64	46	11	100	91	76	39
Switzerland	69	23	37	77	54	61	…	57	10	…	97	86	…
Turkey	21	25	23	…	34	113	…	19	3	90	61	39	19
Ukraine	…	…	7	100	…	…	…	…	…	…	…	…	…
United Kingdom	52	18	32	…	…	61	65	46	9	100	100	77	44

*Without Armenia, Azerbaijan, Cyprus, Georgia, Israel, Turkey.
TVET – technical and vocational education and training
Source: GEM 2021/2022, UNESCO (2022).

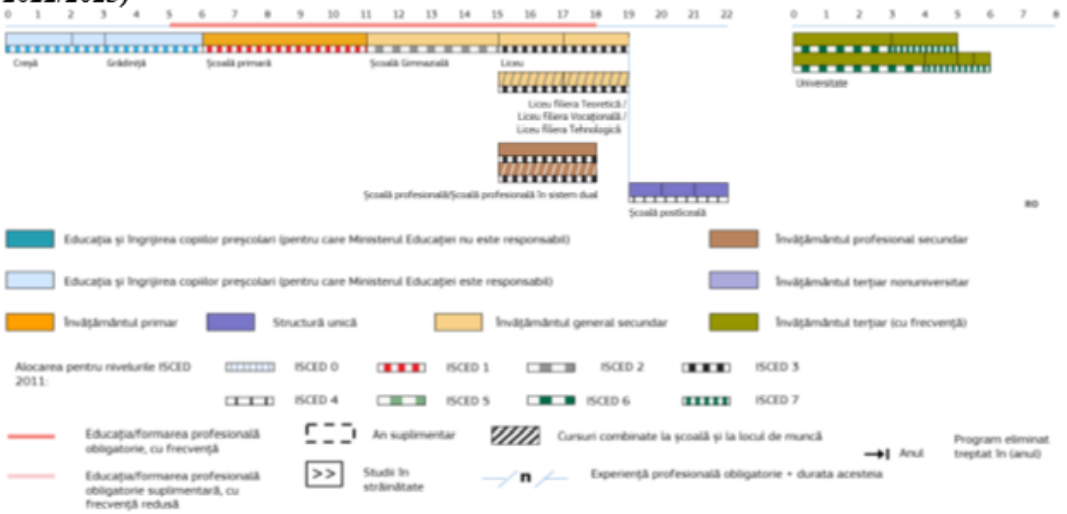
Annex A2. The Bologna Process: From the Sorbonne, 1998 to Paris, 2018

1998 Sorbonne Declaration	*1999 Bologna Declaration*	*2001 The Prague Communiqué*	*2003 The Berlin Communiqué*	*2005 Bergen Communiqué*	*2007 London Communiqué*	*2009 Communiqué from Leuven/ Louvain-la-Neuve*	*2012 Communiqué from Bucharest*	*2015 Yerevan Communiqué*	*2018 Paris Communiqué*
Mobility of students and teachers	Mobility for researchers and administrative staff	The social dimension of mobility	Portability of loans and grants	Attention to visas and work permits	Attention given to pension systems and recognition of qualifications	Objective: 20% graduate mobility by 2020	Exploring ways of automatic recognition of academic qualifications		Digital student data exchanges
A common system with two study cycles	Easily interpretable and comparable degrees	Correct recognition Development of common diplomas	The inclusion of the doctoral level as the third cycle of studies	Adoption of the Qualifications Framework (EHEA) Launch of National Qualifications Frameworks (NQFs)	National Frameworks of Qualifications until 2010	National Frameworks of Qualifications until 2012	Roadmaps for countries without National Qualifications Frameworks	Implementation of the main commitments	The short cycle as a stand-alone skill level The revised diploma supplement
		The social dimension	Equal access	Strengthening the social dimension	National action plans	Quantifiable national targets for the social dimension by 2020	Widening access and completion rates	Social inclusion	Inclusion of under-represented and vulnerable groups
		Lifelong learning (LLL)	Alignment of national policies in the field of LLL Recognition of Prior Learning (RPL)	Flexible learning paths	Partnerships to improve employability	LLL as public responsibility Focus on employability	Increasing employability, LLL and entrepreneurial skills through cooperation with employers	Employability combining academic and workplace learning	
Use of credits	A credit system (ECTS)	ECTS and Diploma Supplement (DS)	ECTS for the accumulation of credits		Consistent use of recognition tools and practices	Implementation of Bologna tools	Ensuring that Bologna tools are based on learning outcomes	Adoption of the Guidelines for the use of ECTS	
	European cooperation in quality	Cooperation between QA and	QA at institutional, national, and	Adoption of European standards and	Creation of the European Quality	Quality as an overarching focus for the EHEA	Allowing EQAR-registered	Adoption of the revised ESG and the	Ensuring compliance

1998 Sorbonne Declaration	*1999 Bologna Declaration*	*2001 The Prague Communiqué*	*2003 The Berlin Communiqué*	*2005 Bergen Communiqué*	*2007 London Communiqué*	*2009 Communiqué from Leuven/ Louvain-la-Neuve*	*2012 Communiqué from Bucharest*	*2015 Yerevan Communiqué*	*2018 Paris Communiqué*
	assurance (QA)	qualification recognition professionals	European level	guidelines for quality assurance (ESG)	Assurance Register (EQAR)		agencies to carry out their activities throughout the EHEA	European Approach to QA relating to joint programmes	with ESG 2015 Promoting the European Approach to QA related to common programmes
Europe of knowledge	European dimensions in the field of higher education	The attractiveness of the EHEA	Connections between higher education and research fields	International cooperation based on values and sustainable development	Adoption of the Strategy for Improving the Global Dimensions of the Bologna Process	Enhancing global political dialogue through the Bologna Political Forums	Evaluation of the implementation of the strategy regarding the global dimension from the year 2007		Developing synergies between EHEA and ERA
								Learning and teaching Relevance and quality	Innovation and inclusion in learning and teaching Digitization and digital skills
								Sustainable development	Support for the United Nations SDGs

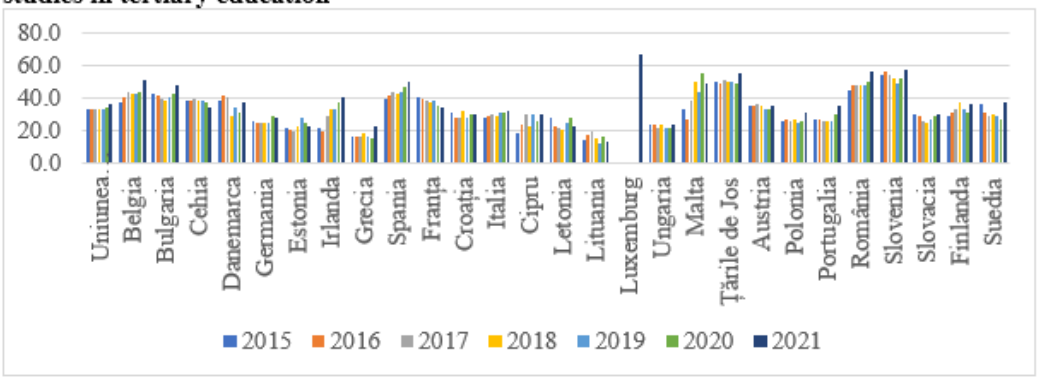
Source : Adapted from EC/EACEA/Eurydice, 2020a.

Annex A3. The structure of the education system in Romania by education level (school year 2022/2023)



Source : European Commission/EACEA/Eurydice, 2022b.

Annex A4. Share of initial vocational/vocational education graduates who continue their studies in tertiary education



Source : Processing by the author, based on data taken from Cedefop.

Telework and the Virtual Communication

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Abstract: *In the context of the pandemic caused by Covid-19, an important aspect that was affected and changed was the way people communicate. The implementation of digitalisation was accelerated worldwide. Communication efficiency can be improved by using modern technologies, for example: mobile devices, digital audio and video platforms, text platforms, social media, chatbots and more. For further economic success, digital skills are needed not only for executives, but also for managers, in order to be able to lead teams and avoid situations of stress and tension in the virtual environment. This scientific paper includes a primary research of how the pandemic affected the communication at the workplace. On the basis of a questionnaire, hypotheses were formulated and validated through statistical methods in SPSS. This research highlighted the particularly important role of communication and, in this context, the role of the remote team leader. In order to keep the team motivated and interested in the virtual environment, the manager must use modern tools to motivate, support and express his appreciation when the team, respectively the members of his team, achieve their goals successfully.*

Key words: Management, telework, communication, human resource management, business, digitalization.

JEL: D83, J24, M15, O33

1. Introduction

Communication efficiency within organizations is a very important and often discussed issue. The scientific literature emphasizes that 75% of the time spent by members of an organization is dedicated to interpersonal communication (Wertheim, 2008).

The rapid speed at which the economy and society as a whole is developing calls for a flexible system that can satisfy the requirements that have recently emerged (Marković, Grgurović, & Štrbac, 2011). In the context of the pandemic caused by Covid-19, an important aspect that was affected and changed was the way people communicate. In particular, communication in the professional environment has gone from a direct communication to a communication in the virtual environment. Thus, citizens around the world have been directly or indirectly affected by the change in the way they carry out their professional activity (Rump & Eilers, 2020). Organizations were also affected, because until the onset of this pandemic, there was not an issue to have enough staff prepared to intervene in the long term and in large enough numbers to eliminate the negative effects of a crisis. All employees of various organizations around the world were thus subjected to this ongoing test (van Fenema, P. C., Romme, A. G. L., 2020).

Telework, a way of doing business known for over 20 years, has become a common practice with the advent of the pandemic (Caligiuri, P., De Cieri, H., Minbaeva, D., Verbeke, A., Zimmermann, Z., 2020). Before the pandemic, more innovative companies planned to use smart working, which can take place both in standard workspaces and in virtual workspaces. The working tools for smart working and teleworking are the same, respectively those used by employees from the onset of the pandemic to the present day (Menshikova, 2020).

Even if not all areas of activity of the economy were affected to the same extent, companies, without exception, had to adapt to a new situation (Butler, 2020). In any case, a significant shift can be observed in both the way people work and communicate, in both professional and personal environments. In the case of organisations, this change is clearly oriented towards the use of modern digital tools in order to continue their activities.

The aim of this paper is to highlight the main aspects of this change from the perspective of organisations and their employees who carry out their activity in Romania. This topic has not been thoroughly analysed so far in relation to organisations in our country. In addition, the paper examines aspects related to the relationship between effective communication within remote teams and 17 independent variables (for example: digital skills, management style, professional experience, etc.). By establishing the relationship between communication and the independent variables, the study identifies ways to improve the results obtained through teleworking. This contributes to creating favourable conditions for achieving better business outcomes.

The study provides an introduction, followed by the theoretical overview of the fields of interest, the research questions and the hypotheses. After that, the research method is described by presenting the framework of the quantitative analysis, along with the related participants and data collection. The presentation of the results is followed by a discussion and finally the conclusions. The study ends with the list of references used.

2. Literature review

2.1. Communication and communication efficiency

In the modern era, communication is an essential element in the life of each human being and of each organisation. The word "communication" has its origin in Latin and actually means "to share". Thus, communication is the act of transmitting a message from an individual or group of individuals to one or more individuals using signs, symbols and semiotic rules known to both parties. Communication channels can be: visual, audio, olfactory, electromagnetic, haptic or biochemical. Nonverbal communication is the process by which a message is transmitted without the use of verbal expression. Nonverbal communication includes: factual communication, gestures, body language, facial expression, eye expression, etc. Nonverbal communication demonstrates one of Paul Watzlawick's laws, which tells us that "an individual cannot not communicate" (Watzlawick, Beavin, & Jackson, 1967).

Verbal communication refers to the transmission of a message in written or oral form. Paraverbal communication is expressed through inarticulate sounds, timbre, intensity and inflection of the voice, emphasis on words, tone, pauses used in expression, sound intensity, etc. This mode of communication supports the understanding of the message, giving it additional nuances and meanings. In this way the messages can be strengthened, contradicted, distorted or replaced (Keenan, 2002).

In organisations, when we talk about the coordination function, we must recognise that its main component is communication. Organizational communication is defined as the process by which messages are exchanged in order to achieve the individual and common goals of the members of that organisation. Management functions cannot be performed without communication. Moreover, the analysis of managerial communication has acquired special attention in terms of solving problems in financial decision-making, because of the large quantities of audio and textual data which are included in the managerial comments (Myšková & Hájek, 2020). Thus, there is no question of whether or not managers engage in the process of communication and whether they communicate well or not. One of the components of the communication process is the context or environment in which the communication takes place. This refers to space, time, mental state, audio and video interference and temperature, which can distract or cause interruptions or distortions in the communication process between sender and receiver. Another important element are the technical means of communication. Depending on the means of communication used, the accuracy of the message transmitted, the speed and the cost of communication are determined. With the transition to remote work, individuals no longer communicate face to face. The means of communication and its context have been moved to the virtual space (Pereteatcu, 2019).

Communication is the key to organisational success and efficiency (Gruning, 1992). For a message to be received correctly, it is important to listen to the other person with openness and empathy, to judge the content and not the sender, and to ask for enough details and then to paraphrase what we heard to make sure we understood it correctly. A manager has an even more difficult role, being in the position of authority, he must show interest in the topics presented and

his body language needs to be appropriate in order to gain confidence and transmit information openly. The manager also has the duty to express his opinion, not only with openness, but also with empathy, communicating his own feelings and emotions transparently (Wertheim, 2008).

Communication efficiency means that the message is delivered quickly, in a way that allows the receiver to hear it, interpret and make use of it as intended by the transmitter. It is defined also, as a process of exchanging ideas, thoughts, knowledge and information, in which the purpose and intention are transmitted in the most appropriate way possible. In other words, it is the process in which the sender presents his point of view in the way that it can be best understood by the receiver. Efficiency is hereby a measure of the extent to which the message is well transmitted, understood and used for solving an intended task (Prachi, 2018).

Any organization needs communication efficiency in order to emphasize competitive advantage, define identity, position itself in the market and gain the desired competitive advantage. For this, all managers must be prepared and develop their communication skills, both inside and outside the organization, to ensure its success (Iacob & Badina, 2017).

Nowadays, information has proven to be a very important element both in the social and economic contexts. The information and communication technology has developed a lot in recent years. The innovations brought by the fourth industrial revolution give us new opportunities and at the same time require us to collect and process a very large amount of data and information (Faloba & Muscalu, 2018).

2.2. Communication in the context of the pandemic

Crises occur at different times and have different intensities. The SARS-CoV-2 epidemic represented a unique disruption that affected both the health and social systems worldwide (Bejaković, Škare, & Pržiklas Družeta, 2021). In the case of the crisis caused by Covid-19, it resulted in great insecurity, major stress and anxiety, which led the population to a tunnel-type vision, oriented mainly towards the present and less towards the future (Mendy, Stewart, & VanAkin, 2020). Ethical behavior in business is more relevant in a time of crisis as all organizations face a new situation full of the unknown and risks (Gurău, 2020).

As this is a pandemic that has affected the entire planet, governments around the world have had to take various measures to prevent the spread of the virus and protect the health of citizens (Fritsche, J. Ph., Harms, P. Ch., 2020). In the case of Dubai, the government decided to implement a five-step plan of action, namely: the initial implementation of remote work for everyone, the granting of paid leave, then the granting of unpaid leave, followed by a temporary reduction in all wages, followed by the organization of unlimited salary reductions (Haak Saheem, 2020).

In crisis situations, in which employees and managers are concerned and worried, communication is a very important element in order to maintain a state of balance within the organization. A correct communication requires the recognition of the limits and personal mistakes of each member of the team, but especially of the manager. The manager must communicate in a way that everyone can understand and involve the team in the decisions that have to be adopted (Sandman & Lanard, 2020). In communicating, we face a series of barriers, either physical, semantic or psychosocial (Lunenburg, 2010).

The importance of modern communication technologies has fundamentally changed, allowing for more complex analyses and comparisons (Zinecker, Doubravský, Balcerzak, Pietrzak, & Dohnal, 2021). Through modern technologies, communication processes can be made more efficient and improved. These technologies are for example: smartphones, email, text platforms, social media and more (Sharma & Sharma, 2015).

In the current context of the pandemic, the use of modern communication technologies, both privately and in the business environment, has become the only solution. For those who are experienced and have advanced digital skills, but are perhaps shyer and less accustomed to public speaking, this is a great advantage. The new generation communicates a lot in the virtual environment, which is why the changes that occurred did not affect them in carrying out their professional activities to the same extent that the older generations were affected. Communication is the essential attribute of the human being. No human activity, regardless of its importance, is carried out without communication (Iacob & Badina, 2017).

Crisis communication can be briefly presented in three steps: the uniqueness of the source of presenting the truth is ensured, then a clear, simple, as humane and very accurate communication is used and the topics and statements made by the manager must be checked beforehand to ensure compliance with reality (Koh, 2020).

In the case of direct communication, in addition to the content we transmit, our message is supported or refuted by our body language, facial expressions and gestures. There are considerable differences between how a woman communicates compared to a man (Khemesh, 2017). However, regardless of the age, gender and culture of a particular person, in the case of virtual communication we refer and focus mainly on the content of the message transmitted.

The pandemic caused by the $v_{it} \sim IID(0, \sigma_v^2)$ Covid-19 virus has accelerated the implementation of digitalisation world- wide. The digital revolution involves drastic changes in business models and methods for gaining added value in business. Digital technologies contribute to the efficiency of the communication process between companies, citizens and government, allowing governments to respond to the needs of citizens and organisations (Olczyk & Kuc-Czarnecka, 2022). New technologies such as big data analytics, social media, cloud computing, mobile computing, the Internet of things and intelligent robots are the engines of current development. Digitalisation has had unfavorable consequences for many companies and industries. Trying to have an exclusive analog business in the future can be the least possible viable option. Companies benefit from digitalisation by creating new business models and new markets, with added value through innovation, new forms of decision-making and, in particular, new forms of employment (Urbach & Ahlemann, 2019). The companies that are being set up today are orienting their business model towards the use of tools offered by digitalisation. This is due to the fact that about half of the world's population has access to the internet. Thus, the vast majority of customers targeted by a company, access the Internet for information exchange, communication with friends, reading news and much more (Zöller, 2019).

In the context of the current crisis, digital technologies have been the only way to communicate and carry out the professional activity of many companies. Many companies did not have their own platforms to use to achieve their goals. In addition, the use of online platforms requires,

for a good part of the employees, the existence of a training. In addition to free online platforms, companies have had the opportunity to buy or create customized platforms. Even if in the first phase, simple emergency solutions were used, in the second phase the companies considered staff training and the improvement of communication tools (PWC, 2020).

2.3. Communication skills in the digital era

Lately, in the scientific literature and in general, the term digitisation is used very often, without having until now a clear definition. In a narrow sense, digitisation means nothing more than the transcription of data from analog to digital. Regarding the moment when the digitisation started, the scientific literature presents different moments. Regardless of the historical moment in which we place the beginning of digitisation, whether it was the change of Arabic numerals in the binary system by Gottfried Wilhelm Leibnitz or the development of the first telegraph in 1833 by Samuel Morse or the development of the first computer in the 1960s, this is not a phenomenon of modern times (Harwardt, 2019).

The digitization of data from the analog system leads to lower production and multiplication costs, making them transmissible worldwide in seconds, easy to process by robots and easy to evaluate with the support of machines (Kröhling, 2017). Information and communication technology is also becoming increasingly used to contribute to sustainable development (Beconytė & Kryžanauskas, 2010). Moreover, new communication and information systems create the link to just-in-time and online decision-making processes in production, supply and logistics chains (Sakalauskas, 2010). The digital economy accounts for around 8% of the world's gross domestic product of the world's top 20 economies. The digital economy also contributes to promoting entrepreneurship and innovation by improving the efficiency of the economic system (Chen, Du, Lan, Wu, & Zhao, 2023). This shows the role that the digital economy plays in developed countries. It is difficult for scientists to define the digital economy due to its multidimensional nature. The digital economy goes beyond the simple notion of the digital sector, which refers to products and services resulting mainly from the use of digital technologies (Zaramenskikh, E.; Fedorova, A., 2020).

The basic structures of communication described by methods of analysis and social networks can be used to identify various organisational forms of communication (Reiss & Steffens, 2010). Organizations today are facing the task of redefining the way they work and, in some cases, even their mission and vision. This is a complex and difficult process that can only be achieved with the direct support and involvement of the people employed in that organization. When the objectives of the organization and the personal ones of the employees are aligned in the same direction, we can speak of motivated and efficient employees. Lack of knowledge, training, information and various barriers in communication can lead to problems of the organization due to -poor motivation of employees (Faloba & Muscalu, 2018).

The overall performance and effectiveness of the organisation is closely linked to employee satisfaction at the workplace, since it influences employee motivation and productivity (Frutos-Bencze, Sokolova, Zubr, & Mohelska, 2022). Factors influencing employee engagement and

motivation have evolved significantly over the past 30 years. This evolution can be presented in four phases. The first phase refers to the period 1990 - 2000 when employees were motivated by the possibility to have a say, to be involved and to have an active participation in the company. Then, the employees looked for a sense of activity and a balance between personal and professional life. Until 2018, employees were still waiting for the workplace to offer them all the resources and possibilities to be able to meet the requirements related to the objectives of the chosen position. Currently, employees want to get involved and identify with the professional activity and objectives of the organization in which they operate. In other words, they are looking for a better life and a meaning for the talent they show and the performance they have within the organization (Turner, 2020).

Currently, employees want to get involved and identify with their professional activity and the objectives of their employer. In addition, they are looking for jobs that give them the opportunity to self-fulfil, but have the flexibility to organize their private and professional life in accordance to their expectations (Hermeier, 2019). Self-realization refers in most cases to the achievement of set goals compared to the role models of each individual. Thus, organizations must provide an environment conducive to the choice of role models and goals that are in the interest of the organization. For achieving those, the organization is prepared to offer employees rewards. The employees are therefore committed and motivated in the long-term (Sass, 2019).

After presenting the employees' expectations, we will also mention their necessary competencies from the organization's point of view. These competencies refer to the ability to decide and lead a team, to cooperate and support colleagues, to interact and present a topic, to be creative and conceptualized, to organize and execute, to adapt easily and last but not least to imitate (Okros, 2020).

These desires and expectations of employees appeared in the context of the permanent transformation of the socio-economic environment. Through continuous innovation, organizations are able to permanently reposition themselves in the current environment of volatile markets. Proposals for innovation are brought to the attention of the organization by both its own employees and external stakeholders (Lochmahr, Müller, Planing, & Popović, 2019). The impressive technological developments of the 21st century offer a series of fascinating and useful solutions to a greater array of problems. IoT technology has proven to have the ability to make our lives easier, develop smart cities and make the world a friendlier place for life. New technologies can also have a high level of e-waste and huge emissions. Thus, the current concern of both researchers and organizations is of how to achieve a green IoT. Thus, the main directions to obtain a green IoT are to reduce emissions and reduce unnecessary consumption (Alsamhi, S. H.; Ma, Ou; Ansari, M. S.; Meng, Q., 2019).

In the current situation, digital skills are needed, including those for communication tasks. Digital skills are needed not only for executives, but also for managers in order to be able to lead teams and avoid situations of stress and tension in the virtual environment (Yi-Lin Forrest, Nicholls, Schimmel, & Liu, 2020).

The communication skills of a manager are very important due to the fact that they influence not only the efficiency of the interlocutor, but of the entire organization (Lunenburg, 2010).

In order to complete the purpose of the study two research questions were formulated and answered. The research questions were:

1. Which are the main advantages and disadvantages of telework in obtaining the desired results for an organisation?

2. What does an organisation need to do in order to improve working in remote teams?

Based on the results obtained regarding the research questions above three hypotheses were formulated:

Hypothesis 1 (H1): Communication efficiency in telework depends on the abilities of the management team!

Hypothesis 2 (H2): Communication efficiency in telework depends on the digital and professional abilities of all team members!

Hypothesis 3 (H3): Communication efficiency in telework depends on the personal characteristics of the team members!

3. Research methodology

The questionnaire contained questions relating to all 18 dependent and independent variables of the process. Each variable represented a quality, ability, or important information evaluated by each single person that answered the questionnaire. At the beginning of the questionnaire three closed questions with a yes or no answer, regarding working or not in remote teams, experience and willingness. The main questions were presented as a seven-point standard Likert scale, used in similar research, with the scales ranging from „not at all" to „extremely much" (i.e. Likert scale 1 – 7).

The respondents had to evaluate, also, on the same scale how much the dependent variable depends on the independent variables.

At the end of the questionnaire, we had questions regarding the age, gender, business experience, rural or urban area and position in the organization (manager or not).

We received 226 responses to the questionnaire in 2020, 428 in 2022 and 932 in 2023. All were validated and considered in the quantitative research conducted.

Not all the respondents had experience in coordinating remote teams, but participated as members of remote teams. 80% of the people with validated answers expressed their intention and willingness to work with confidence and enthusiasm in the future in the remote system. The age range of the respondents was between 18 and 65 years. 19% of the respondents were in a management or team leader position.

The 17 factors (independent variables) were divided into three large groups. The first group was related to the management and the company, the second group to the approach to work by the team members, and the third to the characteristics of each member of the team. The first group includes the following factors: management style (authoritarian or supportive), how to approach and make decisions, training offered to employees, clarity of expression of objectives and possible overload of the team. Regarding the approach to work by the team members, we have the following factors: the professionalism of the team members, the degree of responsibility

shown towards work, the digital competences of the team members, the degree of involvement in the activity and professional experience. The third group includes the following factors: age of the team members, gender, empathy shown within the team and different perceptions of time.

The data obtained as a result of the questionnaire was analyzed with the support of multiple regression, applied in the SPSS program.

4. Results and discussions

The dependent variable for achieving the multiple regression was called "communication efficiency in remote teams". The independent variables chosen in the regression were the 17 main factors that resulted as determinants for communication efficiency as a result of the qualitative research conducted and presented in 2.2. According to the results obtained in the multiple regression, the main factors that influenced communication efficiency were: professionalism, degree of responsibility, degree of involvement, clarity of expression of objectives and decision-making.

The multiple linear regression equation of this research is as follows:

Y= b0+b1X1+b2X2+…+b17X17+u, With: Y= Communication efficiency; b0=0,058; X1, X2, … X17 = the independent variables as follows: ….; b0, b1, b2 … b17 are the coefficients for each independent variable as presented in the Table 1 below and u= is the random error for Y.

Table 1. Coefficients for each independent variable in the model

Variables	*Variable's name*	*Coefficient*	*Coefficient value*
X1	*RProfessionalExperience*	*b1*	*-0,036*
X2	*RProfessionalism*	*b2*	*0,255*
X3	*RResponsabiliy*	*b3*	*-0,146*
X4	*ROverload*	*b4*	*0,016*
X5	*RTimePerception*	*b5*	*0,089*
X6	*RDigitalSkills*	*b6*	*-0,056*
X7	*RInvolvment*	*b7*	*0,200*
X8	*REmpathy*	*b8*	*-0,029*
X9	*RAge*	*b9*	*-0,013*
X10	*RGender*	*b10*	*-0,045*
X11	*RKnowledge*	*b11*	*0,067*
X12	*RAuthoritarianManagementStyle*	*b12*	*-0,068*
X13	*RSupportivManagementStyle*	*b13*	*-0,052*
X14	*RDecisionMaking*	*b14*	*0,142*
X15	*RTaskClarity*	*b15*	*0,215*
X16	*RTraining*	*b16*	*0,095*
X17	*RTrust*	*b17*	*0,315*

Source: Authors' own research.

Table 2 in the SPSS regression output shows the model summary, which provides the value of R (Multiple Correlation), R2 (Coefficient of Determination) and Adjusted R2 (R2 adjusted with Degrees of Freedom). In this model, R (multiple correlation) has the value of 0.963. This shows the multiple correlation between dependent and independent variables. This means that communication efficiency depends more than 96% on the independent variables presented.

Table 2. Regression output – Model Summaryb

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	0,963a	0,927	0,922	0,0385	0,927	193,550
a. Predictors: (Constant), RTrust, RGender, RAuthoritarianManagementStyle, RTimePerception, RTraining, RAge, RKnowledge, ROverload, RSupportivManagementStyle, RProfessionalExperience, RDigitalSkills, REmpathy, RDecisionMaking, RResponsabiliy, RTaskClarity, RProfessionalism, RInvolvment						
b. Dependent Variable: RCommunicationEfficiency						

Source: Authors' own research

The value of R squared tells us that our dependent variable is determined by the independent ones in proportion of 92.2%. This means that there are other factors that influence with a weight of 7.8% the analyzed dependent variable. To validate our hypotheses, this is a very clear result, which shows us once again how important communication is and how many factors depend on its efficiency.

Also, with the support of the SPSS program, we applied the analysis of the variance that gives us the sum of the squares associated with the regression (Sreejesh, S.; Mohapatra, S.; Anusree, M. R., 2014). Their very small value, of only 0.0385, shows us the correctness of the results obtained in the regression. Table 3 reports an analysis of variance (ANOVA). This table shows all the sums of squares associated with regression.

The third column shows the associated degrees of freedom for each sum of squares. The mean sum of squares for the regression and residuals are calculated by dividing respective sum of squares by its degrees of freedom. The most important part in this table is F value, which is calculated by taking the ratio of mean square of regression and mean square of residual. For this model, the F value is 193,550, which is significant (p\.01). This result tells us that there is less than a 0.1 % chance that an F-ratio this large would happen if the null hypothesis were true.

Therefore, looking at the ANOVA table, we can infer that the regression model results in significantly better prediction of communication efficiency.

Table 3. ANOVAa

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	488,186	17	28,717	193,550	0,000b
	Residual	38,724	261	0,148		
	Total	526,910	278			

a. Dependent Variable: RCommunicationEfficiency

b. Predictors: (Constant), RTrust, RGender, RAuthoritarianManagStyle, RTimePerception, RTraining, RAge, RKnowledge, ROverload, RSupportivManagStyle, RProfessionalExperience, RDigitalSkills, REmpathy, RDecisionMaking, RResponsabiliy, RTaskClarity, RProfessionalism, RInvolvment

Source: Authors' own research

Multiple regression confirmed that based on the data obtained after the application of the questionnaire, communication efficiency is one of the most important elements for the success of organizations in the context of the current pandemic. This important factor depends both on the professional training of the team members and on the availability and personal ability of each to adapt quickly to inevitable changes.

According to Table 1, 2 and 3 all three hypotheses were tested and validated in the quantitative research using multiple regression conducted with the support of the SPSS program.

Communication efficiency is an essential element in achieving the objectives of an organization, whether we refer to interpersonal communication, intergroup, intragroup, within the organization or externally. The whole communication process is a very complex one, and errors commonly occur from the simple transmission of information. Socio-psychologists estimate that between 40 to 60% of the information transmitted from the sender to the receiver is lost. In addition, it is known that the human brain perceives signals transmitted by body language more easily and faster than those transmitted by words.

For formulating the interview conclusions, and after gathering all the answers, the responders were selected into two groups. One group included the people that found remote work a positive solution, while the second group included the rest. Telework is generally seen as a solution to keep the level of activity afloat and not as a permanent solution. Around 20% of those interviewed consider remote communication a solution to be used exclusively in cases where they do not have other possibilities and means. They consider face-to-face communication as the most efficient solution to be able to carry out their activity. Of course, those who see remote work as a last resort are especially those who work in areas that involve physical work. Also, a certain restraint towards telework is expressed by those in the public administration, in the health system and partially in education.

Another reason presented by respondents, who do not have much confidence in telework, is the lack of digital skills. Among the negative reasons and limitations of using remote work were

the lack of technology both within the organization and at the home of the employees. During the interview, the level of technology employed by the suppliers and customers that each company works with was also highlighted.

Thus, for a telework system, not only the organization needs technology and staff training, but also the rest of its stakeholders. Among the negative experiences mentioned by remote team leaders were those related to technical issues, such as power outages, loss of internet connection and certain incompatibilities of the equipment available to each member of the team. Other negative aspects that teleworking brings with it are: lack of socialization between colleagues, work overload, lack of personal communication, non-involvement and often the suspicion of superiors that the work is not carried out with the same seriousness from a distance as carried out from the office. All respondents acknowledged that they do not see the possibility of developing their own organization in the future without investing in digitalization. This involves an investment in both technology and staff training. The training and preparation should be planned first, but not exclusively, in the management area in order to properly coordinate the remote teams.

The vast majority of respondents highlighted the benefits of telework as follows: increased productivity by increasing employee attention and eliminating unnecessary workloads in teams, reducing costs at the organizational level, streamlining time, increasing flexibility and overall efficiency of the work carried out. Remote work offers a more relaxed work environment, better concentration, a higher degree of flexibility and a reduction in downtime for each employee. This requires management to provide clear tasks that it can explain correctly, have a well-trained team and communicate directly and honestly.

The necessary conditions for a manager to coordinate the remote team correctly include: knowing the work team, clearly defining objectives, outlining tasks and specifying deadlines, monitoring their achievement, completing objectives and expressing appreciation for the results obtained by the team. One of the respondents emphasized that in the teams he leads he does not forget to celebrate every success they have, even if they do not meet face to face.

The results the remote teams obtained during the period when there was no possibility of working in the regular office depended on communication efficiency. Of course, this is not the only factor that guarantees the success of a team working in a Remote system. In the context of the pandemic, communication was the factor that made the difference. It proved to be relevant, especially in the case of teams formed after the outbreak of the pandemic that forced employees to isolate themselves in their own homes.

The general conclusions of the interview were that one of the main success factors for the work in remote teams was communication efficiency. One other important conclusion was the fact that trust in team members and in the manger was an important issue. A third general conclusion of the interview was the fact that training is needed for everybody in order to assure the long-term success of remote teams. The most frequent mentioned elements were: communication, the need to socialize, the overload of work, the needed training, the trust in the remote team and the new image of the manager. From the big number of elements presented by the respondents, we focused on the ones which influence communication efficiency, because here we could find an interdependent cause-effect.

The three research hypotheses stipulate that the dependent variable is dependent on the independent variables defined in the qualitative research. In other words, communication efficiency in telework is determinate by: the trust of team members and its leaders, digital skills of team members, degree of responsibility with which work in remote teams was approached, the professionalism team members displayed, the training that the team members benefited from, the clarity with which the objectives were transmitted, the way to approach decisions, the management style displayed by the team leader, workload, the necessary specialized knowledge needed to carry out the professional activity, demonstrated empathy of team members, the degree of involvement shown by the team members, the age and sex of the team members.

The study analyzed, also, the possibility that communication efficiency is influenced in general or in remote teams by cultural heterogeneity. This factor proved to be inconclusive in our analysis, so it was not further treated and discussed.

5. Conclusions

This research highlighted the particularly important role of communication and in this context the role of the remote team leader. The team leader must keep in mind that when communicating, it must be done clearly, simply, openly and honestly, in order to be correctly understood by his team members. Lacking the support of body language, virtual communication focuses exclusively on the content of the message expressed. Thus, even more than in the classic activity, the manager must have special communication skills and show empathy towards the members of his team. In order to keep the team motivated and interested in the virtual environment, the manager must use modern tools to motivate, support and express his appreciation when the team, respectively the members of his team, achieve their goals successfully. According to the interviewers, it is important to "celebrate success even in virtual teams."

According to the empiric research, 17 factors were selected to be the main ones determining the success of communication efficiency, and those were taken into consideration in the multiple linear regression. The results also told us that other factors exist. In the special conditions of this study, these represent under 8%.

Because of the current situation, it was very important to understand how the employees manage to work in a remote system and what they need in order to be successful in the future. Therefore, for the companies who supported the research, it was relevant to know the factors that really influence communication efficiency.

Managers must keep in mind that working remotely does not affect relationships between colleagues or between colleagues and superiors. The future use of the telework tool must bring to the attention of management all the elements through which it can support and motivate its team, even remotely.

Managers with experience in coordinating remote teams mentioned that the reluctance towards this new way of organizing and carrying out work by colleagues or subordinates is mainly related to the fact that the vast majority have faced this way of working in a crisis context.

The lack of preparation for this change has led to the known "resistance to change", and

thus, in some cases, a decrease in the efficiency of the work carried out. For the future, it is necessary to prepare and observe that teleworking will be one of the main ways of carrying out activity where it is possible. This type of activity is suitable for people with a medium and a higher education. Basic labor, or physical work, will be in the near future replaced step by step by robots. Thus, a number of jobs will disappear, and the staff involved in this type of work will have to rethink and reorient to other activities necessary for the development of modern society.

Telework does not mean, and should not mean in the future, a form of limiting interpersonal interaction.

One of the main limitations of this study is the context in which this research was conducted. Given that telework and the level of acceptance and its possibilities of use were analyzed in the context of the pandemic caused by Covid-19, the respondents' responses were influenced by a new, unpleasant and sudden situation. This involved additional limitations related to the movement of people from one point to another.

The pandemic caused by Covid-19 brought with it a series of regulations that required citizens to limit their interactions to a minimum, not to leave their houses and not to meet other people. This situation caused, in addition to stress and concern for one's own health, frustration with the inability to interact and communicate directly with loved ones.

REFERENCES:

1. Charles de Seconant, Baron de Montesquieu, 1748. Spirit of Laws, translated by Thomas Nugent, 1752. Kitcherner: Batoche Books, 2001 edition.
2. Sewail L, DeToung C., 2003. Six Sigma in health care. Leadership in Health Services, Volume 4, pp. p. 1-5.
3. Puschmann, T., Alt, R., 2016. Sharing Economy. Bus Inf Syst Eng, Volume 58, pp. 93 - 99.
4. Cohen, B.; Kietzmann, J., 2014. Ride On! Mobility Business Models for the Sharing Economy. Sage Journals, 1 September, 27(3), pp. 279 - 296.
5. Seibel H. D. and Mayumi O., 2009. Restructuring of State-Owned Financial Institutions: Lessons from Bank Rakyat Indonesia. Asian Development Bank: Business & Economics.
6. Jimmerson C, Weber D, Sobek DK, 2005. Reducing waste and errors: piloting Lean principles at Intermountain Healthcare. J Qual Patient Care, pp. p. 249-257.
7. King DL, Ben-Tovim DI, Bassham J. , 2006. Redesigning emergency department patient flows: application of Lean Thinking to health care. Emerg Med Australasia, Volume 4, pp. p. 391-297.
8. Acquier, A et. al., 2017. Promises and paradoxes of the sharing economy: An organizing framework. Technological Forecasting and Social Change, dECEMBER, Volume 125, pp. 1 - 19.
9. Teubner, T.; Flath, Ch. M., 2019. Privacy in the Sharing Economy. Journal of the Association for Information Systems:, 20(3), p. Article 2.
10. Hirsch P. M. and De Soucey M., 2006. Organizational restructuring and its consequences: Rhetorical and structural. s.l.:Annual Review of Sociology.
11. Womack J, Jones D., 1996. Lean Thinking, Banish Waste and Create Wealth in Your Corporationk. p. p. 15–16.

12. Jones D, Mitchell A., 2006. Lean Thinking for the NHS. NHS Confederation.
13. De Koning H, Verver JPS, den Heuvel J, et al., 2006. Lean Six Sigma in healthcare. J Healthcare Q., Volume 2, pp. p. 4-11.
14. Lanham B, Maxson-Cooper P., 2003. Is Six Sigma the answer for nursing to reduce medical errors and enhance patient safety?. Nurs Econ, 21 February, pp. 39-41.
15. Karatzogianni, A.; Matthews, J., 2018. Ideological Production in Digital Intermediation Platforms and Structural Effectivity in the "Sharing Economy". Sage Journals, 1 November, 21(1), pp. 95 - 114.
16. Oxford University Press, 2015. Definition of sharing economy. Oxfort: Oxford Dictionaries.
17. Schor, J. B., 2016. Debating the sharing economy.. Journal of Self-Governance and Management Economics, 3(1), 7–22, pp. 7 - 22.
18. Porter, M. E.; Kramer, M. R., 2019. Creating Shared Value - How to Reinvent Capitalism—And Unleash a Wave of Innovation and Growth. In: Managing Sustainable Business. Dordrecht: Springer, pp. 323 - 346.
19. European Commission, 2016. Country Report Romania 2016 - Including an In-Depth Review on the prevention and correction of macroeconomic imbalance, SWD (2016) 91 final. [Online]
20. Available at: http://ec.europa.eu/europe2020/pdf/c
21. Treapăt LM., Gheorghiu A., Ochkovskaya M., 2018. A Synthesis of the Sharing Economy in Romania and Russia. In: Knowledge Management in the Sharing Economy. Knowledge Management and Organizational Learning,. Cham: Springer.
22. Bellotti, V. et.al., 2015. A muddle of models of motivation for using peer-to-peer economysystems 33rd annual ACM conference on human factors in computing systems. New York, ACM, pp. 1085 - 1094.
23. Costescu, M., 2016. Romania –A Strategic Choice, Bucharest: InvestRomania.
24. Grigoras, V., Tanase, A. & Leonte, A., 2017. Studiu al evoluțiilor sectorului IT&C în România, Bucharest: BNR.
25. Georgescu, R., 2015. Romania's Software Market & ITS Postion on the Global Map, Bucharest: Transfer Pricing Services.
26. Cocirla, C., 2018. Romania A Strategic Choice, Louxemburg: Ministry of the Business Environment, Commerce and Entrepreneurship of Romania.

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Navigating Uncertainty: Insights from Romanian Entrepreneurs on Opportunity Recognition, Resource Use, and Business Resilience during the COVID-19 Crisis

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Abstract: *This article looks into the reasons, tools, approaches, and beliefs that drive early-stage entrepreneurship in Romania. It is based on a thematic analysis of 42 semi-structured interviews carried out in 2020. The study aims to find common trends and categories among entrepreneurs, while also looking at the personal and environmental factors that affect how they start and run businesses. Since the research took place during the COVID-19 pandemic, it provides special insight into how Romanian entrepreneurs viewed and dealt with the challenges of the crisis. The analysis shows the variety of paths entrepreneurs take, how their personal backgrounds connect with their business practices, and how traits like resilience, flexibility, and informal connections help build lasting businesses. The results add to the understanding of opportunity-based entrepreneurship in developing countries and highlight the importance of creating policies that fit the goals and real-life experiences of small business owners.*

Key words: Entrepreneurship, thematic analysis, qualitative research, Romania, resilience, entrepreneurial motivation, NVivo, entrepreneurial identity.

JEL: D83, L26, M13, O17

1. Introduction

The growth and development of start-up businesses have become a major topic in current entrepreneurship studies, especially because they have the ability to drive innovation, create jobs, and boost economic growth (Audretsch & Link, 2019). In the European Union, funding programs like the European Social Fund (ESF) and the European Regional Development Fund (ERDF) have played a key role in supporting new business ventures, particularly in areas that are less economically developed (European Commission, 2020). Romania, which has benefited from these funding sources, has launched national initiatives such as Start-Up Nation and Start-Up Plus, aimed at encouraging entrepreneurship, especially among young people, women, and those moving from regular jobs to self-employment.

However, even with the availability of these programs, recent studies show that having money alone is not enough to make a start-up last.

Entrepreneurial success depends on many factors, including personal motivations (Carsrud & Brännback, 2011), individual characteristics (Rauch & Frese, 2007), access to both physical and non-physical resources (Barney, 1991; Davidsson & Honig, 2003), and the ability to deal with uncertain conditions in the market and economy (Welter & Smallbone, 2011). These challenges are especially tough in developing countries, where the support systems for entrepreneurs are often weak, and the rules and structures are constantly changing (Manolova et al., 2008; Aidis et al., 2008).

This research is even more important when considering the impact of the COVID-19 pandemic. The crisis caused by the coronavirus pandemic has led to a multitude of changes within organizations (Minciu, et al., 2020).

The pandemic has acted as both a sudden disruption and a challenge for the resilience of entrepreneurs (Kuckertz et al., 2020; Stephan et al., 2022). Start-ups that began operating before or during the pandemic faced serious problems such as limited market access, supply chain disruptions, cash flow issues, and challenges in managing their workforce. While some businesses failed to survive these pressures, others quickly adjusted, changed their business strategies, and found new opportunities. The uncertainty that has marked the activity of organizations requires that feedback from each stakeholder be considered (Minciu, et al., 2022). Learning what helped these businesses succeed can lead to better public policies and more effective support for entrepreneurs.

With this in mind, this article examines how Romanian start-up entrepreneurs, who received European funding between 2020 and 2023, used resources, developed connections, handled crises, and included personal values into their business practices.

It also looks at how these entrepreneurs view the local business environment and their involvement—whether direct or indirect—with sustainability principles.

The article is organized as follows: the next section provides a review of existing research on the topic, followed by the methodology, the findings and their analysis, and finally the conclusion.

2. Literature review

2.1 The COVID-19 Pandemic and Entrepreneurial Responses

The start of the COVID-19 pandemic in early 2020 caused a huge global disruption with big effects on the economy, society, and institutions. For business owners, the pandemic brought both serious risks to their businesses and unexpected chances. The sudden change in how people spent money, the limits on movement, and problems with supply chains forced many small and medium businesses to change quickly or risk failing (Fairlie, 2020). Research shows that the pandemic acted like a "crisis accelerator," making businesses rethink their ways of working, move towards digital tools, and change how they offer value.

According to Kuckertz et al. (2020), how well entrepreneurs handled the crisis depended on their industry, access to digital tools, and how much money they had saved. The crisis pushed many businesses to move online, offer delivery services, work remotely, and interact with customers virtually—changes that would have taken years to happen normally. The pandemic also changed how entrepreneurs saw risks and made decisions. As reported by Stephan et al. (2022), it showed weaknesses in support systems for entrepreneurs, especially in poorer countries where help was not reliable. Entrepreneurs were forced to be resilient (Williams et al., 2017), which means they had to act quickly, use their resources creatively, and learn from challenges.

Studies like Brown and Rocha (2020) show that success during the pandemic often came from using what was available in tough situations, a concept called entrepreneurial bricolage. In this way, the crisis supported earlier ideas (like Baker & Nelson, 2005; Sarasvathy, 2001) about the importance of being flexible, making decisions in uncertain times, and working with networks. From a government perspective, support programs (like grants, tax breaks, and help with digital tools) helped reduce the financial damage, but their effectiveness varied between areas and industries. Research shows that new businesses and small companies were hit harder because they had less money and fewer resources to fall back on (OECD, 2020; Bartik et al., 2020).

Overall, the pandemic changed how entrepreneurship works by speeding up digital changes, making resilience more important, and challenging usual ways of growing. The lessons from how entrepreneurs handled the crisis are now part of bigger conversations about keeping businesses running, managing emergencies, and preparing for future big challenges.

2.2 Theoretical Frameworks in Entrepreneurial Opportunity and Practice

Over the last twenty years, studies about entrepreneurship have focused more on how people find, shape, and use opportunities in different economic and system settings. This idea has strong roots in the work of Shane and Venkataraman (2000), who explain entrepreneurship as the process of finding, checking, and using chances that come from differences in information and the way resources are spread out in society. According to this idea, how someone sees an opportunity depends on their existing knowledge and their thinking style.

Another important way of looking at entrepreneurship is the theory of effectuation, introduced by Sarasvathy (2001). This theory says that entrepreneurs don't always start with a clear

chance, but instead begin with what they have—like their skills, knowledge, and connections—to build opportunities step by step. This idea is backed up by Ardichvili, Cardozo, and Ray (2003), who say that past work experience, knowledge, and relationships are key in creating new business chances.

Baker and Nelson (2005) also add to this by talking about entrepreneurial bricolage, which is about using non-traditional or limited resources to come up with workable solutions when things are tough and uncertain. This method is especially useful when starting new businesses during difficult times, like the pandemic, when many business people had to change their ways of doing business.

The resource-based view (RBV) helps explain how both physical and non-physical resources—like knowledge, reputation, and skills—can help entrepreneurs gain and keep an edge in the market. According to Barney (1991), a company can stay economically strong if it has resources that are valuable, rare, hard to copy, and well-organized. The role of institutions in shaping entrepreneurial efforts is discussed in the field of institutional entrepreneurship.

Battilana, Leca, and Boxenbaum (2009) highlight how public policies and regulations can either help or hinder a business's growth. Things like access to European money, easier rules to follow, and available support systems can make it easier to turn an idea into a real business. The social side of entrepreneurship is covered in lots of studies about networking. These studies show that both formal and informal connections play a big role in how successful and long-lasting a business can be.

Digital tools, business organizations, interest groups, and local interactions are seen as important ways to get resources, knowledge, and access to markets (Hoang & Antoncic, 2003). More recently, research has focused on how personal values and the founder's vision shape a company. Studies on identity-based entrepreneurship suggest that small businesses are often built around the founder's personal identity, showing their values, style, and way of living (Shepherd & Haynie, 2009). So, the academic work gives a solid way to understand the findings from this study, which show a mix of approaches that include personal drive, reacting to opportunities, being flexible, and using resources smartly, especially in times of economic instability and uncertainty.

3. Research methodology

This study used a qualitative method that mainly involved semi-structured interviews to collect data. A total of 42 interviews were done with active entrepreneurs from different business areas between April and December 2020. The project was part of an educational effort supported by master's students, and it aimed to better understand how entrepreneurship worked in Romania during a time of high uncertainty and fast changes.

Each interview was recorded with a voice recorder, then written down completely, and later analyzed using NVivo software (version 14) to do a detailed thematic analysis. The coding process mixed two approaches: one that came from the stories shared by the entrepreneurs and another based on ideas from academic research. The analysis followed five main steps: getting

to know the data, creating first codes, finding main themes, improving those themes, and finally naming them. Using NVivo helped create visual tools like word clouds and allowed for deep exploration of repeated ideas and stories.

The analysis paid attention not just to how often certain topics came up, but also to the deeper meanings and the specific situations described by the entrepreneurs. This way of doing things was especially good for studying something as complicated and ever-changing as starting a new business, especially during the disruptive time of the COVID-19 pandemic. It helped record personal views, decisions, and core values, giving insight into how people's actions and the environment around them together shape the path of entrepreneurship in Romania.

4. Results and discussions

Motivation for Starting a Business and Previous Experience

The analysis of the 42 interviews shows that people started their businesses for different reasons, which created a wide range of entrepreneurial profiles. All of them, however, share a common trait: a strong sense of purpose and personal drive. These reasons can be grouped into six main themes, each showing a different way people become entrepreneurs, based on their professional, social, and emotional backgrounds. The most common theme is people starting businesses because they are passionate about a particular field, like cooking, sports, teaching, design, technology, or art. For them, the main reason isn't just money—it's about expressing themselves, turning a hobby into a job, or offering others a real experience. Another group of people started their businesses because they wanted to be financially and professionally independent. They wanted to avoid depending on others, have control over their time and money, and manage their own work. This motivation usually comes from being unhappy with past jobs that felt too strict, impersonal, or not offering enough growth. A third group saw a chance in the market—either a gap in services or products in a certain area, or new opportunities that came from things like the pandemic or digital changes. These entrepreneurs were very practical, looking at what was available and how they could use it. Some were influenced by family or close friends. Their motivation came from either continuing a family tradition or receiving support from loved ones. This was especially true in rural or semi-urban areas, where business and family are closely connected. Many of these entrepreneurs had experience in other jobs, even if they didn't have formal training in starting a business. They used that experience as a foundation, gaining skills and confidence that helped them in their new role.

Finally, there's a unique group of entrepreneurs whose choice to start a business came from personal changes or major life events. These events might include getting married or divorced, moving to a new place, facing health issues, or trying to balance work and family life. These entrepreneurs set up businesses that not only meet what customers want but also match their personal values and the lifestyle they want. This variety of reasons shows how complex being an entrepreneur is in modern Romania. Starting a business isn't just about money—it's also about personal, social, and emotional factors. Because of this, helping entrepreneurs should include more than just things like loans, rules, and taxes. It should also look at the personal needs and reasons that lead someone to start a business.

Economic Opportunities Capitalized in Entrepreneurial Initiatives

The answers given by the entrepreneurs show a wide variety of economic opportunities they noticed and used. These opportunities often came from understanding how markets work along with paying attention to what's happening in their local or national areas. Many of these business ideas started because there were gaps in the system or areas that weren't getting enough attention, like a lack of financial education, places to sell food products, or digital tools for managing human resources. For some people, their business idea came from seeing a need in their own life or within their community, such as a need for training companies, quick delivery of classic cakes, or healthy products that are linked directly to their source. Others noticed big changes in how consumers are acting or how society is changing, like more people using digital tools, wanting handmade or eco-friendly products, or being interested in eSports and audio-video formats. Some businesses were created when people changed their careers or professional paths, like starting courses for adults with ANC certification after university or using money from European programs. Others focused on existing industries, like residential construction, transportation, or the hospitality, restaurants, and catering (HoReCa) sectors, but made their services more tailored to local needs or built their own production processes. Many new ideas came from areas of the market that weren't being used well, such as weighted blankets, custom aquariums, products related to emotional well-being, private tours, or retro music gear. At the same time, some entrepreneurs turned local or geographical resources into a big advantage, like opening beach bars in areas that weren't being used well or setting up near public buildings to make sure there's always a steady customer base.

Available Resources and Their Sources

Entrepreneurs in the start-up phase use a wide variety of resources, which come from different parts of their personal, professional, and institutional lives. Usually, the money they start with isn't a lot, but they make up for it with things like personal skills, social connections, or symbolic value. Many people used their own money, like savings, income from past work, or money from selling things. This money was either used directly to start the business or to get a loan from the bank. When they didn't have much money, friends or family helped out—either by lending them money or by giving them space, equipment, or knowledge. In some cases, family gave actual things like land, crops, or tools that could be used in the business. Some entrepreneurs also got help from outside programs, like Start-Up Nation, Start-Up Plus, or European grants. These funds were used for buying equipment, setting up a place to work, or paying for the first costs of running the business. Sometimes, they got money in steps, depending on how much they had saved or how the grant payments were given. For some people, the biggest resource was the knowledge and experience they had from working in their field before. They used their skills, know-how, and connections they made as employees or partners. Things like technical skills, training, and access to information were seen as important ways to make up for not having much money. Others used non-traditional ways to get help, like reading a lot, getting advice from people, working with specialists, or choosing the right partners. Some started with almost nothing, like a computer they won in a contest, a website they made themselves, or just an idea that was

tested with friends or family. In those cases, they relied on their personal connections and their own effort to make up for a small budget. Also, being organized and working with family or close friends was common, particularly in small businesses. Overall, the responses show that starting a business isn't just about having money. It's about combining different kinds of resources—like things you own, people you know, and relationships you have. This shows that entrepreneurship in Romania is strong, flexible, and based on smartly using what's available.

Networking and Network Membership

Entrepreneurs in the sample used different ways to connect with professional or informal groups, showing varied attitudes towards networking. For some, being part of networks—like online groups, organizations, or local communities—was key to growing their businesses. Others focused more on their own efforts and direct relationships, without relying much on formal networks. Many used digital platforms like Facebook, Instagram, or YouTube to build online communities and keep in touch with customers, suppliers, and partners. These platforms helped them promote their work and build trust and a strong brand. Joining online groups, professional organizations, business chambers, or clubs like Rotary, Bizz Club, HR Club, or ANIS also helped them connect with more people and form useful partnerships. Some built their support network through personal connections, like friends, old coworkers, or people they worked with before. Even though this wasn't formal, it played an important role in getting their first customers, finding team members, or getting important information. In small, local, or handmade businesses, personal connections and word-of-mouth were often more valuable than joining official groups. Some entrepreneurs didn't focus much on formal networking and instead kept things simple, running their business within their family or through direct work. For them, success came from being reliable, making high-quality products, and keeping customers happy. Others were still building their networks, planning to join groups, attend events, or work on strengthening relationships. Especially those in tech, education, or online shopping saw the need to connect with others to grow their businesses and come up with new ideas.

Personal Traits Reflected in the Business

The responses from the entrepreneurs show that, in many cases, their business is more than just a company—it's an extension of their personality. Their values, how they work, how they interact with others, and even the look of their products or services often mirror their personal characteristics. For some, being serious, responsible, and hardworking helped shape the company's culture, which in turn affected how they dealt with customers, suppliers, and employees. In these cases, the company's reputation is closely linked to how consistently the founder behaves and how committed they are to doing a good job. In other cases, being empathetic, honest, and open helped create a leadership style that encouraged teamwork and a supportive work environment focused on personal growth. Many entrepreneurs mentioned that they want to run their business based on strong personal values like creativity, being different, having good taste, or seeking authenticity. These values are shown through the design of their products, how they present their brand, and the overall vibe of the business. Especially in creative or specialized fields, having

the business reflect the founder's personality seems really important for success and keeping the brand's identity clear. Many entrepreneurs talked about how their leadership qualities affected their team—either by encouraging teamwork and learning, or by setting high standards for professionalism and being on time. In many cases, the founder's values became the standard behavior for the whole team. This happened partly because most businesses are small and the founders are heavily involved in daily tasks. There were also examples where the founder's personal style showed up in the visual look of the business and how they interact with customers—like through branding, the way they choose to communicate, or the messages they send. Small or handmade businesses often become a reflection of the founder's personal beliefs or way of life, where the product itself also shows a personal touch. Some responses showed that the founder had a very hands-on approach, controlling every part of the business. Traits like being perfect, very careful, or totally responsible appeared in the decisions made, the procedures followed, and the expectations set for others. Overall, the entrepreneurs interviewed often built their businesses to reflect their personal values and characteristics. They see this overlap as a benefit that helps them stand out, ensures their business feels real, and gives them an edge in the market.

Business Evolution Stages and Crisis Strategies

The paths of the businesses studied show mostly slow changes, going through steps like becoming bigger, combining parts of the business, and changing how they operate. Many business owners said their growth was connected to how well they could handle unexpected problems, deal with tough situations, and keep changing to fit what the market needed. The COVID-19 pandemic was seen as a big test but also a chance to change direction. Business owners reacted by making their work more digital, moving things online, starting delivery services, changing how their teams worked, or even starting over with new business ideas. Many said the pandemic made them rethink their plans, slow down some activities, or adjust what they offered based on new customer habits. Along with the health crisis, other big challenges were mentioned, like shortages of skilled workers, slow or confusing government processes, and not knowing what to expect from the government. These problems were often handled by offering more services, careful money management, redesigning how things are done, or changing when payments are made. Some business owners used small grants, loans, or help from mentors to get through tough times. For some companies, growth happened step by step—from running alone to having a company with more rules, from small test areas to full stores, from simple setups to full restaurants, or from family-run businesses to more complex groups with teams and procedures. Others grew in a more flexible way, depending on one-time chances or local needs. Some businesses, even in their early days, showed they could change quickly when faced with problems, finding new customer groups or coming up with creative ways to fit new market trends. There were also cases where business owners chose not to grow because they didn't have enough money or wanted to keep full control. This choice was often tied to having strong customers and a focus on long-term success. Overall, the businesses studied showed a lot of strength and ability to change. Their growth was shaped by how quickly they could make decisions during crises and by keeping true to their original ideas. Crises were not seen as total stoppers but as chances to change and make new plans, showing a clear level of smart business thinking.

Perceptions of the Romanian Business Environment

Entrepreneurs' responses paint a picture of the Romanian business scene that's both promising and tough. There are chances, but also big problems that are hard to fix. People's views about the situation are mixed—some are hopeful but careful, while others feel frustrated because things aren't improving enough. A few think Romania is getting better, especially because of changes in how some processes work and more support for private businesses. These entrepreneurs see a shift toward a more open environment, especially in fast-moving areas like technology, sports, and online shopping, or among younger business owners who are readier to take risks and change. However, many others still deal with old problems like too many rules, unpredictable laws, a shortage of workers, and not enough help from government agencies. They also mention unfair competition, corruption, and high taxes as big issues that make it hard for small and medium businesses to grow and stay professional. A common theme is that there's not enough teaching about starting businesses and a weak culture of entrepreneurship, which affects what people want in the market and the skills of the workers available. Some founders say that the market naturally rewards good ideas and strong management, showing that the business environment is slowly getting better, at least in some areas and industries. The pandemic had a big impact—it was both a challenge and a turning point. Some sectors struggled with uncertainty and stopped growing, while others found new ways to do business, like delivery services and online training. Some entrepreneurs think the pandemic made them rethink their priorities, push for more efficiency, and change how they run their companies. There's also a difference in how people see things based on their industry and experience. Those in creative, education, or technical fields often see good progress and new possibilities, while those in retail, food service, or physical businesses face more difficulties and more trouble dealing with government rules.

Sustainability Concerns

Although sustainability wasn't directly mentioned in every interview, looking at the responses shows that many entrepreneurs have an underlying care for sustainability, even if they don't talk about it straight out. This concern often comes up in different ways—like caring for the environment, keeping their businesses running smoothly, ensuring their team stays stable, or building strong connections with customers. Some entrepreneurs show sustainability through their choices, like using natural, local, recyclable, or healthy products. These choices aren't always called sustainability strategies, but they come from values like wanting quality, being genuine, and looking after the community. For example, using locally made products or traditional recipes, recycling inside food businesses, or offering services that help people—like education, health care, sports, or lifestyle support—show an understanding of sustainability without saying it directly. Other practices that entrepreneurs see as sustainable include having flexible business plans that can change over time, using digital tools to improve how they work, and focusing on growing their businesses. These things show they care about staying economically strong and not wasting resources—like people's time, money, or logistics—even if they don't call it an environmental strategy. Some specific efforts that clearly help the environment were mentioned, like encouraging alternative ways to get around, such as offering free bike seats, reducing the

environmental effect of production, and working with local, real businesses. In IT or creative service businesses, sustainability is linked to making sure services keep running, delivering high-quality work, and building long-term customer trust. But many people didn't mention sustainability at all, which might mean they don't have a formal plan for it, or they have a different idea of what sustainability means based on their industry, their goals, and where their business is in its growth. Even though sustainability isn't always clearly talked about, the values and actions seen in these businesses suggest a kind of responsibility that could become stronger if entrepreneurs get more information, training, and support to include sustainability in their bigger plans.

5. Conclusions

The interviews show a clear set of conclusions and lessons from the entrepreneurs' experiences, highlighting a way of doing business that is based on staying strong, being able to change, and being true to oneself. Even though the reasons for starting a business can be different—ranging from sudden ideas to well-planned strategies—most entrepreneurs talk about the importance of starting small and taking things step by step. This allows them to learn from their mistakes and build the business slowly over time. One of the most common ideas mentioned is the importance of passion—whether it's for a product, working with customers, or the work itself. Passion is seen as a source of energy and motivation, especially when things get tough. Perseverance and courage are also widely recognized as key qualities for dealing with challenges, trying new ideas, and helping the business grow genuinely. For many entrepreneurs, being able to adapt to change has become essential for success. Crises, especially those caused by the pandemic, pushed businesses to quickly change their plans, learn new skills, and accept uncertainty as part of daily operations. This ability to adapt is often connected to the ability to reinvent themselves, whether through new business models, how they position their products, or how they relate to their market. The value of personal and professional relationships is also noted, especially in building a good reputation, working with others, and getting support during tough times. The idea that "an entrepreneur is someone who solves problems" comes up again and again, along with the belief that keeping customers happy and focusing on quality are important for long-term success. Many entrepreneurs also stress the importance of education and learning—both for their own growth and for helping their team or their customers. Having an open mind, being able to reflect, and using feedback are seen as important advantages. The lessons shared by these entrepreneurs show a growing local entrepreneurial culture, where personal values and market needs are connected, and success is seen as coming from a mix of passion, smart planning, persistence, and real human connections.

Based on the analysis of 42 interviews and in connection with existing research on entrepreneurship, several key trends have emerged regarding how Romanian entrepreneurs spot and take advantage of economic opportunities. The findings can be related to several important theories, offering both practical support and deeper understanding.

First, many of the interviewees identified opportunities by addressing specific problems in the market, such as a lack of financial education, artisanal goods, food and beverage services, or IT systems in their local areas. This aligns with the Opportunity Identification Theory by Shane

and Venkataraman (2000), which states that entrepreneurial opportunities come from differences in how people perceive value and from gaps in information.

Second, several entrepreneurs used economic or social crises—especially the COVID-19 pandemic—to change direction or start new ventures in areas like digitalization, online services, or fast professional training.

These findings match the idea of entrepreneurial bricolage, as described by Baker and Nelson (2005), which shows how entrepreneurs creatively use available resources during uncertain times.

Third, many of the businesses studied focused on specialized or new markets, such as weighted blankets, custom aquariums, or handmade goods with emotional appeal.

These efforts show the logic of effectuation, as explained by Sarasvathy (2001), where entrepreneurs build opportunities based on their own resources and connections rather than starting with a fully defined idea.

Fourth, having prior experience in certain fields was often mentioned as a major factor in recognizing opportunities. Entrepreneurs who had worked in consulting, hospitality, or construction used their knowledge to find meaningful business ideas. This supports the idea that specific knowledge and mental resources are important in identifying and growing entrepreneurial opportunities, as explained by Ardichvili, Cardozo, and Ray (2003).

Fifth, several entrepreneurs pointed to institutional factors like EU funding, certification programs (such as ANC), or supportive regulations as important for starting new businesses.

These observations fit with the theory of institutional entrepreneurship, which highlights how public policies and institutional settings can either help or hinder entrepreneurial activity, as discussed by Battilana et al. (2009).

Lastly, in all the cases studied, whether an opportunity was viable depended on the entrepreneur's ability to get resources—both physical and intangible, such as knowledge, relationships, or symbolic capital.

This supports the relevance of the resource-based view (RBV), as proposed by Barney (1991), which suggests that businesses gain an advantage when they have resources that are valuable, rare, hard to copy, and well-organized. Together, these findings underscore the importance of integrating context-specific evidence with theoretical insights to better understand the complex, multi-dimensional processes through which entrepreneurs in Romania initiate, adapt, and grow their ventures.

REFERENCES:

1. Aidis, R., Estrin, S. & Mickiewicz, T. (2008). Institutions and entrepreneurship development in Russia: A comparative perspective. Journal of Business Venturing, 23(6), pp.656–672. Available at: https://doi.org/10.1016/j.jbusvent.2008.01.005
2. Ardichvili, A., Cardozo, R. & Ray, S. (2003). A theory of entrepreneurial opportunity identification and development. Journal of Business Venturing, 18(1), pp.105–123. Available at: https://doi.org/10.1016/S0883-9026(01)00068-4

3. Audretsch, D.B. & Link, A.N. (2019). Embracing an entrepreneurial ecosystem: An analysis of the governance of research joint ventures. Small Business Economics, 52, pp.429–436. Available at: https://doi.org/10.1007/s11187-017-9953-8
4. Baker, T. & Nelson, R.E. (2005). Creating something from nothing: Resource construction through entrepreneurial bricolage. Administrative Science Quarterly, 50(3), pp.329–366. Available at: https://doi.org/10.2189/asqu.2005.50.3.329
5. Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. Journal of Management, 17(1), pp.99–120. Available at: https://doi.org/10.1177/014920639101700108
6. Bartik, A.W. et al. (2020). The impact of COVID-19 on small business outcomes and expectations. Proceedings of the National Academy of Sciences, 117(30), pp.17656–17666. Available at: https://doi.org/10.1073/pnas.2006991117
7. Battilana, J., Leca, B. & Boxenbaum, E. (2009). How Actors Change Institutions: Towards a Theory of Institutional Entrepreneurship. Academy of Management Annals, 3(1), pp.65–107. Available at: https://doi.org/10.1080/19416520903053598
8. Brown, R. & Rocha, A. (2020). Entrepreneurial uncertainty during the COVID-19 crisis: Mapping the temporal dynamics of entrepreneurial finance. Journal of Business Venturing Insights, 14, e00174. Available at: https://doi.org/10.1016/j.jbvi.2020.e00174
9. Carsrud, A.L. & Brännback, M. (2011). Entrepreneurial motivations: What do we still need to know? Journal of Small Business Management, 49(1), pp.9–26. Available at: https://doi.org/10.1111/j.1540-627X.2010.00312.x
10. Davidsson, P. & Honig, B. (2003). The role of social and human capital among nascent entrepreneurs. Journal of Business Venturing, 18(3), pp.301–331. Available at: https://doi.org/10.1016/S0883-9026(02)00097-6
11. European Commission (2020). Support to SMEs – Increasing Research and Innovation in SMEs and Startups (European Structural and Investment Funds 2014–2020). Publications Office of the European Union. Available at: https://op.europa.eu/en/publication-detail/-/publication/8e23e4ea-415c-11eb-b27b-01aa75ed71a1
12. Fairlie, R.W. (2020). The impact of COVID-19 on small business owners: The first three months after social-distancing restrictions. Journal of Economics & Management Strategy, 29(4), pp.727–740. Available at: https://doi.org/10.1111/jems.12400
13. Hoang, H. & Antoncic, B. (2003). Network-based research in entrepreneurship: A critical review. Journal of Business Venturing, 18(2), pp.165–187. Available at: https://doi.org/10.1016/S0883-9026(02)00081-2
14. Kuckertz, A. et al. (2020). Startups in times of crisis – A rapid response to the COVID-19 pandemic. Journal of Business Venturing Insights, 13, e00169. Available at: https://doi.org/10.1016/j.jbvi.2020.e00169
15. Manolova, T.S., Eunni, R.V. & Gyoshev, B.S. (2008). Institutional environments for entrepreneurship: Evidence from emerging economies in Eastern Europe. Entrepreneurship Theory and Practice, 32(1), pp.203–218. Available at: https://doi.org/10.1111/j.1540-6520.2007.00222.x
16. Minciu, M., Dobrea, R. C. & Loghin, M. (2022). The connection/link between the VUCA world and the need for organizational change. Proceedings of the International Management Conference, Faculty of Management, Bucharest University of Economic Studies, November, 16(1), 913-920.
17. Minciu, M., Dobrea, R. C., Staiculescu, C. & Stoica, B. S. (2020). The Impact of the Epidemic Generated by the SARS-COV-2 Virus in the Context of the VUCA World. Management and Economics Review, 5(2),

246-254. https://doi.org/10.24818/mer/2020.12-05.

18. Rauch, A. & Frese, M. (2007). Let's put the person back into entrepreneurship research: A meta-analysis on the relationship between business owners' personality traits, business creation, and success. European Journal of Work and Organizational Psychology, 16(4), pp.353–385. Available at: https://doi.org/10.1080/13594320701595438
19. Sarasvathy, S.D. (2001). Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency. Academy of Management Review, 26(2), pp.243–263. Available at: https://doi.org/10.5465/amr.2001.4378020
20. Shane, S. & Venkataraman, S. (2000). The Promise of Entrepreneurship as a Field of Research. Academy of Management Review, 25(1), pp.217–226. Available at: https://doi.org/10.5465/amr.2000.2791611
21. Shepherd, D.A. & Haynie, J.M. (2009). Birds of a feather don't always flock together: Identity management in entrepreneurship. Journal of Business Venturing, 24(4), pp.316–337. Available at: https://doi.org/10.1016/j.jbusvent.2007.10.005
22. Stephan, U. et al. (2022). Entrepreneurship during crises – exploring the immediate and long-term consequences of crisis events for entrepreneurial action and outcomes. Small Business Economics, 58, pp.689–708. Available at: https://doi.org/10.1007/s11187-021-00518-0
23. Welter, F. & Smallbone, D. (2011). Institutional perspectives on entrepreneurial behavior in challenging environments. Journal of Small Business Management, 49(1), pp.107–125. Available at: https://doi.org/10.1111/j.1540-627X.2010.00317.x
24. Williams, T.A. et al. (2017). Organizational response to adversity: Fusing crisis management and resilience research streams. Academy of Management Annals, 11(2), pp.733–769. Available at: https://doi.org/10.5465/annals.2015.0134