
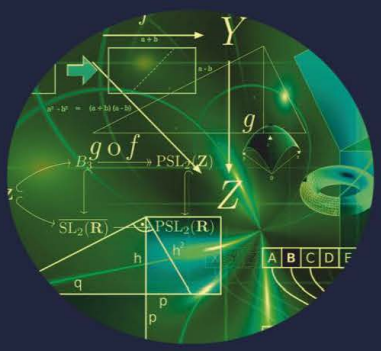
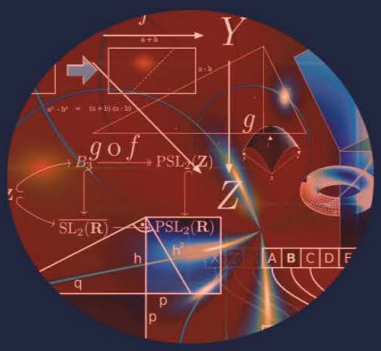
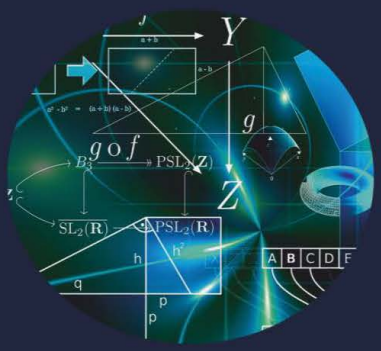

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CONTEMPORARY CHALLENGES IN EDUCATION

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Warsaw – Lviv 2022

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CONTENTS

Chapter II
EDUCATION AND SOCIAL COHESION DEVELOPMENT

INTRODUCTION

Progress in digital technologies is changing the way we think, the way we work, the way we commute, the way we design, produce, commercialize and generate value from products and services. The new industrial paradigm will demand for new skills and competencies. Education institutions play an important role in shaping a new society, however, most today's education systems need to be improved for meeting the contemporary challenges. We should reinvent our education systems, preparing people with skills and knowledge to design and invent solutions to our most pressing problems (e.g population growth, growing inequality, population ageing, climate change, among others) and reimagine society to face Industry 4.0 challenges.

This publication contains the authors' vision on contemporary challenges in education. It was compiled according to the results of International Education Forum held in Lviv (Ukraine) on 16–17 September, 2021. The event was organized by the National Agency of the Erasmus+ and the European Solidarity Corps of the Foundation for the Development of the Education System (FRSE) and the Faculty of International Relations of the Ivan Franko National University of Lviv, which celebrates its 360th anniversary this year.

An important aim was to bring together representatives from scientific and academic environment, informal education, public authorities and business from the countries of Eastern Partnership and the European Union.

The Forum focused on challenges in the development of education system in the face of the Fourth Industrial Revolution and COVID-19 pandemic. It also addressed the issue of quality in formal and informal education, which has a direct impact on the competencies of young people under the challenges of the 21st century.

The Forum also covered the Erasmus+ program within the new financial perspective of the European Union 2021–2027. International educational mobility is an important instrument for the development of young people, which should be supported by governmental and non-governmental institutions, educational institutions and business. The Forum provided a platform for discussion and exchange of experience between representatives of different sectors.

This publication may be useful for scientists, politicians, students and those, who are interested in this field. We would like to express thanks to Authors for their insightful scientific discourse and to wish the creative inspiration, approbation of scientific ideas and further development of our cooperation in the scientific field!

Sincerely,
Editors

CHAPTER I

EDUCATION TOWARDS THE CHALLENGES OF INDUSTRIAL REVOLUTION 4.0

Denys SVYRYDENKO[*]
Frol REVIN[**]

EDUCATIONAL AND INDUSTRY 4.0 CHALLENGES AMIDST THE COVID-19 PANDEMIC: PERSPECTIVES OF SCIENCE EDUCATION

One of the key characteristics of the modern era is the dominance of globalization trends in all spheres of human social life. Although the globalization phenomenon is not an exclusive feature of the third millennium, no other historical period has experienced the intense transformative impacts witnessed by the 21st century. Needless to say that, the ongoing globalizational processes are characterized by a systematic and consistent influence on the various spheres of our lives: political, economic, socio-cultural, educational, healthcare, etc. Hence, in academic environment, the debate still persists as to the role of science education in the context of numerous challenges posed by an increasingly tumultuous character of contemporary societal development.

On the one hand, globalization creates conditions for the development of a new type of society – a holistic, open, transnational space, able to shed the colonial vestiges of the past, remove national barriers while mitigating numerous social conflicts emerging both locally and internationally. Alternatively, despite many obvious benefits, globalization has a number of significant downsides, namely, it leads to an increased gap between rich and poor countries, dilutes and causes a loss of identity within more traditional sociocultural communities stemming from (to a large degree) the pressures of the expansionary policy of transnational corporations, erodes ethnic values and traditions.

An equally important research strand brought about by the onset of the rapid technological development is addressing the challenges of Industry 4.0 relating to science education. Primarily, it has to do with the way of using of novel technological tools by educators which has a particular effect on how knowledge is acquired and imparted. By reex-

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amining their teaching methodology, lecturers aim to equip their students not only with the capacity to engage in computerized information acquisition, but seek to provide them with a set of up-to-date learning techniques which meet the demands of the current tech-infused job market. Moreover, educational staff around the world has doubts about the science education curriculum and its possibility to provide a balanced knowledge acquisition experience. In particular, due to the rapid progress achieved in remote instruction, students are now able to rely on live streaming sessions, virtual labs, and other web-augmented types of learning, all of which provides an unprecedented alternative to pre-COVID means of more conventional (physical and electronic) study environments.

Education 4.0: the future of study and workplace

The latest 2020 World Bank "Future of Jobs" report contains several rather alarming predictions pertaining to the development of the labor market in our modern-day tightly interlinked societies. Rapid automation, coupled with the hardships of the economic recession and the mutating COVID-19 virus, create an incredibly challenging "multipronged threat" scenario for the employees on all levels. In addition to the current hazards caused by numerous pandemic lockdowns and the stagnant shrinking of the global economy, the data suggests that companies with significant technological reliance (wishing to secure a competitive edge) will be forced to modernize employee training and skills before 2025[1]. The authors further estimate that by this time, 85 million jobs can be displaced due to a change in the distribution of labor, with more and more posts becoming fully or partially automated. At the same time, up to 97 million new vocational opportunities may appear, reflecting a growing trend in the distribution of labor tasks and resources between people, machines and algorithms. Another estimate presents that developed countries will experience a disappearance of over half of traditional professions in the near future, with no particular prognosis as to what sorts of new employment opportunities are going to be offered instead[2]. This fact presents a number of pressing ethical and other more practical considerations for the education system. For one, how do universities deal with students who enroll to study more conventional specialties with little to no technical qualification requirements? More specifically,

[1] *World Development Report 2019*, https://www.worldbank.org/en/publication/wdr2019 [10.10.2021].
[2] Ibidem.

should they take on first-year students who wish to gain a specialty in fields that will no longer exist and/or be relevant at the time of their graduation? How should schools position themselves in terms of newly emerging educational spheres? How does a university exercise its prognostication capacities trying to predict future developments, particular vocational shifts, and market peculiarities? More importantly, how does a university ensure an up-to-date quality of its educational services, meeting the newest trends and offering know-how in these rapidly emerging economic and labor segments?[3]

Faced with all of these crucial challenges, it is important to note that Ukrainian higher education perceives a transition to online forms of study (necessitated by the recent COVID-19 situation) more from a tactical standpoint, while for many European learning establishments and systems as well as for the global educational market, in general, these radical shifts have long been viewed as a key strategical point at the crux of an evolving technocratic paradigm in pedagogics. Indeed, the specificity of higher education worldwide bears evident signs of inertia, when the desire to combine traditions and innovations does not favor the latter. In Ukraine, higher education is a complex mix of national and global (European) approaches which feeds on myths regarding the lost quality of once-legendary Soviet education and still (to a large degree) shapes the mentality and outlook of many teachers. As a result, an overwhelming amount of red tape along with a stagnantly bureaucratized system does not allow ideas propagating competitive struggle for the quality of educational services to firmly take hold and start bringing positive changes.

Thus, one must regrettably state that the current overly-traditionalist opposition 'enchanted' by the educational tradition does not allow to productively upgrade educational services, bringing them in line with the challenges of the COVID-19 pandemic and Industry 4.0 demands. One of the principal hurdles blocking the way to reorganized modern pedagogical practices is a persistent conviction held by many more conservative educational systems (Ukraine is among them) which believes teaching to be a unity of education and upbringing[4]. When carefully examined, the educational experience of developed countries reveals that many student (course) groups are comprised of people aged between 18 and 70, who come from various cultures and worldview orientations

[3] D. Svyrydenko, *Higher education in the face of XXI century challenges*, "Philosophy and Cosmology" 2014, no. 12, p. 259.

[4] V. Shevchenko, N. Malysh, O. Tkachuk-Miroshnychenko, *Distance learning in Ukraine in COVID-19 emergency,* "Open Learning: The Journal of Open, Distance and e-Learning", doi:10.1080/02680513.2021.1967115 [10.09.2021].

and, most importantly, who enroll to receive practical skills allowing them professional competitive advantages. In light of this, the purpose of patriotic education of already mature personalities, considering that more than half of the students are (frequently) representatives of other countries, appears rather unproductive, leading astray from the pragmatic focus on providing quality educational services geared towards acquiring vocational competency. More importantly, the benefits of an online learning experience have demonstrated that universities suffer from real competition posed by platforms like Coursera or Prometheus, which (thanks to their flexible, user-oriented design) are able to neutralize inertia, inherent in more orthodox, overly bureaucratized systems of higher education.

The impact of COVID has brought visible changes not just to the technical side of education, but fewer students are enticed by the physical pathos (lavish campus) of such elite educational communities as Oxford or the Ivy League. A rising global trend has witnessed the emergence of several dozen mega universities with more than one million students following an ideology of online learning. The main among such establishments is the Indira Gandhi National University boasting about seven million students who receive their training and degrees online. In addition to India, United States, Mexico, Turkey, Pakistan and several other nations have, likewise, joined the ranks of countries providing electronically facilitated education with full or partial degrees offered as part of various distance-learning programs. Quarantine and other imposed restrictions seem to be not a challenge to overcome, but rather a possibility for rethinking and recalibrating our academic approaches in order to meet and benefit from productive global technological trends in (higher) education[5].

Consequently, a teaching methodology, which for many decades relied on the theoretical tenets of educational institutionalism, should strive to find new conceptual and material resources that would meet the pressing challenges of the presently bifurcating intellectual potential of the human civilization without disregarding our core biological and psychological makeup. The recent World Philosophical Congress, held once every 5 years, in 2018 was dedicated to the theme "Learning to Be Human", whereby the question of mankind to stay truly humane in our electronically ubiquitous, socially tumultuous day and age. Long before the outbreak of the COVID-19 pandemic, intellectuals from around the world remarked on the challenges posed to social institutions (family, education, work, etc.) by our technological development. These discus-

[5] M.J. Reiss, *Science Education in the Light of COVID-19: The Contribution of History, Philosophy and Sociology of Science*, "Science & education" 2020, no. 4(29), p. 1082.

sions often circled around the concept of the New Enlightenment perceived as the force that preserves humanity, safeguarding against potential negative influences related to the rapid encroachment of artificial intelligence, rampant technocracy, digital barbarism and other dehumanizing facets of the Internet age[6]. Consequently, the challenges of the Pandemic and the Fourth Industrial Revolution will increasingly require a more proactive attitude on the part of teachers in aiming for instilling in their students a sense of accountability and social responsibility. Hence, nowadays educators are required not only to competently impart knowledge but to act as capable facilitators of the novel digital age values and expertise, who are able to address rapidly transforming technological and civilizational challenges.

In recent years, especially in the context of the proclamation of the Fourth Industrial Revolution, the ability of educators to provide up-to-date vocational skills has been the subject of active debate. Although, the precise list of skills is a subject to revision, more traditionally, these included creativity and innovation, critical thinking and problem solving, communication and cooperation skills, informational literacy, social skills, flexibility and adaptability, etc. The authors are convinced that to effectively take root within a given educational system, there should be a turn away from (or a limited emphasis on) utilizing traditional teaching methodologies and a shift towards pragmatism, constructivism and neoprogressivism. Subsequently, developed educational systems now favor the rising trend of science education, which is based on the development of experimental, research-oriented modes of thinking and is becoming widespread as a guiding principle of many liberal arts curricula[7]. In particular, a revamped, modernized curriculum of science education aims to nurture a new generation of field professionals (and scientifically-minded individuals), who are able to fruitfully balance the demands of empirical research and the rigors of attaining a proper conceptual apparatus.

As a dynamic concept, it does not view a teacher as the single, exhaustive source of information, but assigns him/her the role of a responsive mentor who guides and oversees the various spheres of the student's research. The practical result of such learning/teaching methodology presupposes the emergence of a new type of mentality, which approaches utilizing of the scientific method as a multifaceted tool addressing a specific technical challenge (Industry 4.0 and its various impacts), and

[6] M. Enright, *Education for a New Enlightment*, 2011, https://www.atlassociety.org/post/education-for-a-new-enlightenment [10.09.2021].
[7] I. Vuksanović Herceg, V. Kuč, V.M. Mijušković, T. Herceg, *Challenges and Driving Forces for Industry 4.0 Implementation*, "Sustainability" 2020, no. 10(12), p. 4208.

science itself, as a means to solving practical issues of a particular person, family, city, state or planet[8].

Recognized as one of the priorities for UNESCO in the 21st century, science education can make a critical contribution to overcoming the bane of COVID-19, help mitigate the hazards of climate change and other environmental issues by shaping and informing a responsible civic position and scientific outlook. Moreover, when properly wielded, the potential of science education is able to guard an adequately trained individual against all manner of harmful, pseudo-scientific influences. Our confidence in the prospect of this revolutionary educational direction is reinforced by the contents of the published in 2015 analytical report by the European Commission titled "Science education for responsible citizenship"[9].

Of particular relevance are the views expressed in this document regarding mandatory science education for every individual in the process of a life-long learning cycle, starting with preschool, and continuing all the way to the acquisition of secondary and higher education. The report puts an additional emphasis on the fact that in the modern interconnected world, facing with constantly increasing competition and technological sophistication, personal self-betterment of citizens through education and research is no longer a recommendation, but is quickly becoming the new norm. By receiving proper (extra) vocational training, members of the general public will be able to make informed, responsible decisions, based on scientific modes of thinking and data, becoming the drivers of cumulative innovation as integral facilitators of the growing knowledge-based economy.

To sum this section up, we would like to underscore the impact of Industrial Revolution 4.0 throughout the educational realm which brought about drastic reconfiguration, moving the educators away from methods based on traditional inculcation towards embracing technology-based teaching characterized by the trend of autonomous student improvement that underpins modern education. Accordingly, a swiftly growing number of students tend to educate themselves employing blended learning (heutagogy, paragogy, cybergogy) alongside a host of other supplementary modern resources and gadgets, gaining knowledge through various mobile applications and internet platforms, digital classrooms, interactive exhibitions, gamification, VoIP based videotele-

[8] A. Shahroom, H. Norhayati, *Industrial Revolution 4.0 and Education*, "International Journal of Academic Research in Business and Social Sciences" 2018, no. 9(8), p. 316.
[9] Science Education for Responsible Citizenship. (*Report to the European Commission of the Expert Group on Science Education*), European Commission, Brussels 2015, http://ec.europa.eu/research/swafs/pdf/pub_science_education/KI-NA-26-893-EN-N.pdf [10.09.2021].

phony, all of which makes the study process infinitely more appealing and accessible to the new generation.

Teaching in the 21st century: STEM and other contemporary educational practices

An effective utilization of the ICT infrastructure, in particular, digital technologies, can help to boost the level of technical adroitness among the general public. These efforts will undoubtedly necessitate the clarification of the teaching approaches requiring a strict systematization of the latest educational technologies underpinning the technological dimension of science education. We argue that STEM education can indeed become the basis for the formation of such innovative competencies. Again, through ensuring adequate technical training of teachers coupled with access to relevant electronic tools and resources, these measures are bound to prove successful in developing a sustainable paradigm of digitized science education[10].

Moreover, science education should focus on providing conditions for uninhibited communication and exchange of approaches and ideas within its curriculum with other subjects and fields. These efforts ought to include not only mathematical and technical disciplines, but should take advantage of modern artistic (hence, STEAM) innovations in education and learning. By equipping themselves with cutting-edge methods and technologies which closely mirror the development of digital educational resources, it is paramount that teachers have unrestricted access to the latest pedagogical internship opportunities, university (on and off campus) training and professional qualification courses. Most importantly, modern education should focus not on the transfer of a certain body of knowledge pertinent to specific narrow tasks but should aim to foster proper formulation of research and questions, stimulate interest in social issues, encourage curiosity and cognitive development, stir and support various manifestations of creativity and initiative. Relying on responsible citizenry contributing to the development of the state's scientific potential, who show commitment and resolve to take part in the working out of effective ways to address current (and account for future) issues, science education is more than capable of addressing the impending challenges of the ongoing pandemic[11].

[10] D.W. White, *What is STEM education and why is it important?*, "Florida Association of Teacher Educators Journal" 2014, no. 1(14), p. 3.
[11] S.H. Mian, B. Salah, W. Ameen, K. Moiduddin, H. Alkhalefah, *Adapting Universities for Sustainability Education in Industry 4.0: Channel of Challenges and Opportunities*, "Sustainability" 2020, no. 15(12), p. 6100.

Developed as a pro-active approach, it positions itself as a pedagogical breakthrough ensuring proper training of the wide array of (non)academic specialists, whose professional expertise is based not on hands-on, but practice-oriented study activities, utilizing critical thinking and experimental methods of research. We feel that every member of society, regardless of the level of knowledge, should have a certain set of social competencies: be able to make decisions and take responsibility for them, resolve conflicts nonviolently, possess a certain level of adaptability when faced with difficulties, maintain relationships with others based on mutual respect, etc. Again, viewed through the prism of the recent upheavals caused by the COVID-19, the task of science education has further transformed to the establishing a safe learning environment, which provides opportunities for anyone to clearly understand and explore the ramifications of his/her actions, acting as a responsible and informed person in the face of complex global challenges.

Ray Sandipan and Sanjeeva Srivastava conjecture that the negative effects of the Pandemic on science learning can be mitigated by an increased emphasis on electronic and other web-facilitated study activities. Suggesting a structured, straightforward approach to student-centered online learning of scientific disciplines, they are confident that a reworked theoretic component together with virtual lab and similar research simulation and a variety of complimentary home-based experimental activities can be adapted and altered when necessary in order to accrue maximal knowledge acquisition gains[12].

At the same time, we are convinced that when COVID-19 is finally curbed and overcome, students and teachers will return to their classrooms at schools and universities with all epidemiological restrictions lifted. Conversely, we do not share the attitudes expressed by certain groups of society who believe that remote education will become a mandatory new norm. In our view, as a response to the ongoing pandemic, education must surely undergo certain paradigmatic transformations, which have much to do with the ideas about widespread remote teaching. Teachers and educators who were severely affected having to face unmotivated students during periods of prolonged school closure suffered from uncertainty coupled with the need to provide educational services in this unknown reality[13].

Capitalizing on recent coronavirus developments, properly tuned and tweaking educational agendas and curriculum of progressive institu-

[12] R. Sandipan, S. Sanjeeva, *Virtualization of science education: a lesson from the COVID-19 pandemic*, "Journal of Proteins and Proteomics" 2020, no. 2(11), p. 2.
[13] D. Hodson, *Time for action: Science education for an alternative future*, "International Journal of Science Education" 2003, no. 6(25), p. 657.

tions can make a positive contribution by raising awareness among school and university students regarding threats posed by the COVID-19 pandemic. Lastly, it is important to note that the pedagogical benefits of science education do not necessarily presuppose the prospects of creating efficient antiviral drugs, but rather focus on providing relevant learning incentives, an ability to conduct basic research, aiding students to reveal their innate aptitudes and contribute to the development of their country and civilization as a whole[14].

Conclusions

The potential of educators to directly influence and make an important contribution to the development of a scientifically shaped outlook (ability to solve complex problems at the national and global levels) through the training of scientifically literate individuals who are able to lead productive lives in a modern dynamic world is undeniably a good practice. As one of the major priorities for UNESCO in the 21st century, science education can make a critical contribution to overcoming the bane of COVID-19, can help to mitigate the hazards of climate change and other environmental issues by shaping and instilling a responsible civic position and critical, inquisitive outlook. When properly utilized, the potential of this kind of education helps to save an educated person from all manner of harmful, pseudo-scientific influences. At the same time, the development of science-informed pedagogics is of great importance not just in terms of training narrow field professionals, but ought to bring positive changes by being employed to enlighten members of the general public. Recognized as an integral priority for UNESCO in the 21st century, science education is capable of mitigating the hazards of climate change and assist in the resolution of other environmental issues by cultivating a responsible and rational civic position. These efforts ought to include the revision of not only mathematical and technical curriculum, but should take advantage of the widest possible array of modern innovations in education and learning. To this end, the authors of this paper are convinced that each member of society, regardless of the level of knowledge, should have a certain set of vital social competencies: be able to make decisions and take responsibility for them, to resolve conflicts in a peaceful and democratic manner, to gather the necessary resources for adaptation to difficult existential circumstances, and to maintain relationships with others based on trust and mutual respect. Finally, in light of the constantly shifting circumstances

[14] S.K. Abell, N.G. Lederman (eds.), *Handbook of research on science education*, Lawrence Erlbaum Associates, Mahwah–New Jersey 2007, p. 71.

of the COVID-19 pandemic, the task of science education has expanded and transformed and is now additionally focused on establishing a safe optimal learning environment, which provides opportunities for anyone to be able to analyze, to predict and explore the ramifications of their actions, acting as a responsible, introspective person in the face of complex global challenges.

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Ludmiła MALINOWSKA[**]

ERASMUS+ PROGRAM SUPPORTING ADULT EDUCATION IN POLAND AND EUROPE

Adult education has been developed in Europe under the influence of demand for democratic equality and civic participation. As a result, an understanding of adult education has emerged on our continent, which emphasizes a specific type of social relations based on interests related to education[1]. This resulted in less interest of European andragogy in individual adult learning, which is why today we are dealing with a deficit of knowledge on this subject, considering the fact that adult education was mostly perceived from the perspective of various types of organizations (state, workplace) in Poland after the 1980s[2].

The tradition of thinking about adult education in terms of individual process of development supported by education was born in America in the 1920s within two approaches: scientific, initiated by Edward L. Thorndike[3], aiming at a precise, experimental description of adult and artistic learning, who sought to discover new knowledge through intuition and analysis of experiences. This research was initiated by the work of Eduard C. Lindeman[4], in which he defined adult education as an undertaking based on cooperation within the framework of non-authoritarian, informal learning, the main goal of which is to discover the meaning of experiences; it is a journey of the mind in which it digs into the roots of the preconceived judgments that shape our conduct; it is a learning technique that makes education align with life and

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[1] M. Malewski, *Teorie andragogiczne. Metodologia teoretyczności dyscypliny naukowej*, Wroclaw 1998, p. 152.

[2] H. Solarczyk-Szwec, *Dorośli uczą się inaczej? W poszukiwaniu kategorii pojęciowych opisujących proces uczenia się dorosłych*, „Teraźniejszość-Człowiek-Edukacja" 2010, no. 1(49), p. 51.

[3] E.L. Thorndike, *Adult Learning*, New York 1928.

[4] E.C. Lindeman, *The meaning of adult education*, New York 1926.

therefore elevates his experience to the level of an adventurous experiment[5].

Despite the dominance of the sociological approach to adult education, we can also find examples of research and reflection on adult learning in Polish literature. Nowadays, in times of reflective modernization, we observe activities that integrate knowledge from various fields, which serves education, including adult education, which is a complex of issues of an interdisciplinary nature that requires viewing from various theoretical perspectives[6].

Adult education – an introduction to the issue

Despite many studies on the adult education, it is still relevant in terms of its scope, form and group of recipients. The broad educational activity of adults has been classified by Helen Colley, Phil Hodkinson and Janice Malcolm[7]. They propose to divide it into formal, non-formal and informal education. The authors of the research refer to historical, social, political and economic contexts without which, in their opinion, adult education cannot be interpreted, especially today. As Pierścieniak[8] claims, with reference to this assumption, if we are talking about the beginnings of this type of education, in a given historical period, the use of the indicated term or the terminology related to it was legitimate. This may have an impact on the interpretation problem of contemporary researchers. The authors (Colley, Hodkinson, Malcolm) distinguish two main trends in the learning activity of adults. The first one is the trend of highly industrialized society, where adult education was the only formal activity, most often related to professional work. Only the content that led to changes in learners' knowledge was considered as educational, and its implementation took place in specially defined structures, such as institutions, under the guidance of an authorized specialist. The effects of this type of learning were confirmed by obtaining additional, formal qualifications. In the case of the proposed classification, other activities of adults were considered as non-educational[9].

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[5] R. Gessner (ed.), *The democratic man: Selected writings of Eduard C. L. Lindeman*, Boston – Beacon 1956, [in:] M.S. Knowels, E.F. Holton III, R.A. Swanson, *Edukacja dorosłych*, Warsaw 2009, p. 169.

[6] H. Solarczyk-Szwec, *Dorośli uczą…*, op. cit., p. 162.

[7] H. Colley, J. Malcolm, P. Hodkinson, *The interrelationships between informal and formal learning,* „Journal of workplace learning" 2003, no. 15(7/8), pp. 313-318.

[8] K. Pierścieniak, *Nieformalna edukacja dorosłych. Wokół zakresów i znaczeń*, „Rocznik Andragogiczny" 2009, pp. 79-98.

[9] H. Colley, J. Malcolm, P. Hodkinson, *The interrelationships…*, op. cit., pp. 313-318.

Sylvia Scribner and Michael Cole[10] talked about similar educational effects, but outside the formal structures, who questioned such a narrow understanding of the concept. In their opinion, adults can achieve similar learning outcomes through extracurricular activities, the result of which is not necessarily a diploma or certificate obtained from education by using textbooks or other scientific materials. However, they did not separate the educational activity from the institution, the specific place where the course or training takes place. An important and final element of the indicated form of learning is the deliberate and permanent change the learner has undergone.

On the basis of these two separate understandings of adult education as formal or non-formal learning, Pierścieniak[11] looks for a relationship between the two forms of education. He distinguishes two possibilities of correlation. The first one is the complementarity relationship, where non-formal education plays the role of supplementing deficits arising in formal education. The second form is the principle of alternation. Here, a natural alternative to formal education is non-formal education, and this alternative may also result from the quality of the educational process.

In a situation where adult education is understood only, or as part of an institution, or an enterprise that is part of or supports the formal system, Anna Sfard[12] presented her proposal to identify the phenomenon of adult education as a process of social participation. The obvious dependence was noticed, namely that the adult functions in the social environment. Already in the early 1990s, Jean Lave and Etienne Wegner emphasized that one of the basic values of adult learning is the social nature of this process. Taking into account the indicated perspective, it can be concluded that it is impossible to start learning without belonging. Belonging is manifested in the knowledge and understanding of the norms in a given society, along with its values, dependencies, i.e. history and culture. Knowing these elements very often takes place in a non-formal way, for example through observation or communication[13]. Thus, in real human life, which takes place regardless of forms and definitions imposed by scientists and researchers, this learning process can be natural, informal, or even imperceptible.

[10] M. Cole, S. Scribner, *Cognitive Consequences of Formal and Informal Education*, „Science" 1973, pp. 553-559.
[11] K. Pierścieniak, *Nieformalna edukacja…*, op. cit., pp. 79-98.
[12] A. Sfard, *On Two Metaphors for Learning and the Danger of Choosing Just One*, „Educational Researcher" 1998, no. 27(2/4).
[13] K. Pierścieniak, *Nieformalna edukacja…*, op. cit., pp. 79-98.

Daniel Livingstone[14] emphasized, however, that if we want to talk about adult education, describe it, and apply it, it should show intentionality. First of all, it is worth paying attention to the proposed division of educational activity by the researcher. The first proposition is formal education, where the scope of knowledge needed by an adult learner is determined by the teacher. Then there is a non-formal education, during which adult learners choose the scope of knowledge they want to acquire, although they use the help of a teacher who accompanies them in this process. Informal learning and development is the third of four forms of adult education delivery. This proposal shows a kind of spontaneity and randomness and may be related to work or social activity. Meanwhile, the teacher or mentor played an important role in this type of education, who is a kind of guardian of the transferred knowledge. The last category is informal learning, which is understood as any type of activity aimed at mastering knowledge or skills, which occurs without a previously developed program and in any situation. In the classification proposed by Livingstone, there is no clearly marked process of social participation, which, according to Sfard, appears as one of the forms of adult education.

Adult education is often used interchangeably with another related concept of lifelong learning. Taking into account the target group, i.e. adults, they fit into the concept of lifelong learning as a part of it, and it is much larger. The meaning of this concept has not been definitively clarified and the meanings assigned to it are not always consistent[15].

In the so-called Delors[16] report, i.e. the report to UNESCO of the International Commission on Education for the Twenty-first Century "Learning: the treasure within" from 1996, the concept of lifelong education is defined as a learning process that should last from childhood to death, and should include all treatments that will allow a person to get to know the dynamics of the world, other people and himself. This is to be done by the flexible combination of four fundamental teaching principles, namely: learn to know; learn to act; learn to live together; learn to be. In this education throughout life, the European Commission saw the

[14] D.W. Livingstone, *Exploring the icebergs of adult learning*. *Findings of the First Canadian Survey of Informal Learning Practices*, „The Canadian Journal for the Study of Adult Education" 2000, pp. 3-4.

[15] *Uczenie się przez całe życie: rola systemów edukacji w państwach członkowskich Unii Europejskiej. Przegląd sytuacji w poszczególnych krajach*, Europejskie Biuro Eurydice, Brussels 2000, p. 9.

[16] Raport dla UNESCO Międzynarodowej Komisji do spraw Edukacji dla XXI wieku pod przewodnictwem Jacques'a Delorsa „Edukacja: jest w niej ukryty skarb" (1998), translation: W. Rabczuk, Warsaw.

key to the gates of the 21st century[17]. It is not about the development of professional life but non-compulsory general or vocational education.

In such a widely described and defined issue, the terminology itself is also not consistent. In the case of lifelong learning, the term lifelong education is also used interchangeably, where the latter suggestion may have negative associations with a formal education system.

Adult education in Europe

European society is aging. According to data from the European Commission[18], it is predicted that by 2070, 30.3% of the population will be over 65, and 13.2% will be over 80. This is a significant increase compared to 2019, where the number of people over 65 was 20.3%, and over 80 was 5.8%. Therefore, adult education is becoming increasingly important to European society. It is supposed to provide active and healthy aging and the enjoyment of life throughout its entire duration. In response to alarming statistics, the European Commission adopted a Green Paper on an aging population. It is intended to be the first step to start a political debate on the challenges and opportunities of an aging population in Europe. It is supposed to lead to the creation of reaction tools and their implementation.

Małgorzata Szpilska[19] emphasizes that thanks to new skills, adults can react quickly enough to changes in the world. As a result, effective functioning on the labor market, even at a mature age, and without an age limit, as well as being active in your personal life and your communities. One of the ambassadors of non-formal adult education in Europe is the European non-governmental organization. The European Association for the Education of Adults (EAEA), which has its headquarters in Brussels, has been operating since 1953 (then as the European Bureau of Adult Education). The Association brings together 142 organizations from 44 countries. EAEA works to promote adult learning in Europe and to increase participation and access to formal, informal and non-formal education for all. It cooperates, among others, with the Council of Europe, the International Council for Adult Education (ICAE), United Na-

[17] *Uczenie się przez całe życie: rola systemów edukacji w państwach członkowskich Unii Europejskiej. Przegląd sytuacji w poszczególnych krajach*, Europejskie Biuro Eurydice, Brussels 2000, p. 9.

[18] *Skutki zmian demograficznych w Europie*, https://ec.europa.eu/info/strategy/priorities-2019-2024/new-push-european-democracy/impact-demographic-change-europe_pl [20.10.2021].

[19] M. Szpilska, *Europejczycy dla edukacji dorosłych*, [in:] M. Chodniewicz, A. Respondek (eds.), *Oblicza niezawodowej edukacji dorosłych w programie Erasmus+*, Warsaw 2017, p. 12.

tions Educational, Scientific and Cultural Organization (UNESCO), the Americal Association for Adult and Continuing Education (AAACE), and also supports and promotes partnership building, educational policy development, teaching, research and joint European projects.

In 1970, when Paul Langrand, Director of the UNESCO Department of Education, presented the report "An introduction to lifelong learning" at the UNESCO conference, it was clear that international institutions should pay attention to the adult education. The appointment, following the report, of the Education Development Commission, composed of seven eminent experts from different countries, was the first step to take actions and define international policies for the years to come. After two years, that is in 1972, the UNESCO Commission published the results of the research of the designated Ccommission. The report was released under the title "Learning to be. The world of education today and tomorrow". In the report, the Commission stressed that everyone has the right to education throughout their life, not only can they do it, but they should. The report recommended linking the formal education system with the informal one, and thus fair distribution of resources between these systems and educational activities for the youngest and the oldest. The importance of quality (where flexibility is one of the conditions) of education, and not of the system itself, was particularly emphasized. The report states that the possibility of learning should be provided to as many people as possible, which requires the removal of barriers preventing access to education for the most disadvantaged groups[20].

The concept of lifelong learning aroused the interest of OECD (Organization for Economic Co-operation and Development) in those years, which published a report entitled "Recurrent education: a strategy for lifelong learning"[21]. Here, these issues were considered in the context of the requirements of the world economy and competitiveness. At that time, special attention was paid to professional activity and individual learning. Re-education, called in the report, mainly concerned extra-compulsory general and vocational education.

Moving from the history on the topic to real-world tools for supporting the development of adult education in various countries, the program created by the European Commission for the integration of the European Union's society – the Erasmus + Program – is definitely at the

[20] *Uczenie się przez całe życie: rola systemów edukacji w państwach członkowskich Unii Europejskiej. Przegląd sytuacji w poszczególnych krajach*, Europejskie Biuro Eurydice, Brussels 2000, p. 9.
[21] Ibidem.

fore. It is worth noting, however, that the program can also be implemented in other countries of the world.

Within the Erasmus +[22] program, the adult education has been distinguished within the institutions related to non-professional adult education. It is a continuation of the Grundtvig program, which operated in 2007-2013 under the Lifelong Learning Program.

Erasmus + is the European Union's[23] program for education, training, youth and sport for 2014-2020 and 2021-2027[24]. The areas selected by the European Commission (education, training, youth, sport) are to be a response to the upcoming socio-economic changes. The implementation of the Erasmus + program should contribute to the implementation of the priorities of the strategic program of the European Union, related to activities for economic growth, employment, as well as social justice and social inclusion. In the program objectives for 2014-2020, the fight against high unemployment, especially among young people, was particularly emphasized. The threat here seems to be a short education process, which translates into lower employment opportunities and social marginalization. Not only young people are at risk in the field of employment, the European Commission stresses that low-skilled adults can also be affected by this problem. Education and life-long education are to keep pace with changes and trends in the contemporary and future world, such as new technologies and digitization. It increases competitiveness, especially when the knowledge is exploited through the use of talent or innovation[25].

These assumptions of the Erasmus + program are not the only ones of the flagship project of the European Union. The integration of the European environment plays a special role here, including inclusive activities that enable EU citizens to actively participate in democratic social life. The implementation of Erasmus projects ensures promotion of common European values, support of social integration, increase of intercultural understanding and strengthen the sense of belonging.

According to the 2018 Erasmus + Program Guide: "Erasmus + is designed to support the efforts of Program Countries to make effective use of Europe's human and social potential, while reaffirming the principle of lifelong learning by linking support to formal, non-formal and informal learning in the fields of education, training and sport. The pro-

[22] *Program Erasmus+ w Polsce. Raport 2014*, Warszawa 2018, p. 43.
[23] Erasmus + Program Guide, Version 2 (2019), 2018.
[24] Regulation (EU) No. 1288/2013 Of The European Parliament And Of The Council of 11 December 2013 establishing "Erasmus +": the EU program for education, training, youth and sport, http://eur-lex.europa.eu/LexUriServ/ LexUriServ.do?uri =OJ:L:2013 :347:0050:0073:PL:PDF.
[25] *Erasmus + Program Guide*, Version 2 (2019), 2018, pp. 1-12.

gram also increases opportunities for cooperation and mobility with Partner Countries, notably in the field of higher education and youth"[26]. The Erasmus + program was established in line with the previous (over 25 years of operation) European education and training programs. These programs had intra-EU and international scope. Erasmus + was created from the amalgamation of programs implemented by the European Commission in 2007-2013, such as Lifelong Learning, Youth in Action, Erasmus Mundus, Tempus, Alfa, Edulink and programs in cooperation with industrialized countries in the field of higher education. These programs supported activities oscillating around higher education, vocational education and training, school education, adult and youth education[27].

The assumption is that Erasmus+ is to be a strong and widely recognizable brand associated with promoting synergy, mutual inspiration in various fields of education, supporting new ideas, attracting new entities from the work environment and civil society, and stimulating new forms of cooperation. Guidelines for the Program, such as application of rules and objectives, descriptions of sectors and actions, are published annually in the Program Guide, originally in English, followed by translations in the national languages of the participating countries. The annual update of the Guide also takes into account the current policy of the European Union and the socio-economic situation.

In 2021, another seven-year edition of the Erasmus+ Program has began, with the budget perspective exceeding EUR 28 billion (in the years 2014-2020 it was EUR 14.7 billion)[28]. The assumptions of the next edition of the Erasmus+[29] program are based on the success of the previous edition, taking into account a wider and more accessible offer. It is an offer for more participants, a greater and more diverse number of beneficiaries with an emphasis on qualitative impact and building inclusive, cohesive and green societies prepared for participation in the digital world.

According to the program, the citizens of the European Union should have better knowledge and better skills in order to be able to adapt to a changing society, which is more mobile, multicultural and digital. Studying or work in another country should become a daily reality for the European, with knowledge of at least two languages in addition to the mother tongue. The program is a key element in supporting the

[26] Ibidem, p. 6.
[27] Ibidem, p. 7.
[28] *Nowy Erasmus+: budżet ponad 28 mld euro*, https://erasmusplus.org.pl/aktualnosci/nowy-erasmus-budzet-ponad-28-mld-euro [20.10.2021].
[29] *Erasmus + Program Guide*, Version 2 (2021).

achievement of the goals of the European Education Area, the Digital Education Action Plan 2021-2027, the EU Youth Strategy and the EU Work Plan for Sport, and takes into account risks and lessons that can be learned from the COVID-19 pandemic[30].

"The overall objective of the program is to support, as part of life-long learning and training, the educational, professional and personal development of people in the context of education, training, youth and sport in Europe and beyond, thus contributing to sustainable economic growth, the creation of high job quality and social cohesion, fostering innovation and strengthening European identity and active citizenship. As such, the program is a key instrument for building a European Education Area, supporting the implementation of the European Strategic Cooperation in Education and Training, with its underpinning sectoral programs, enhancing cooperation in the field of youth policy under the EU Youth Strategy 2019-2027, and development of the European dimension of sport"[31].

The highlighted specific objectives of the program include activities such as promoting the learning mobility of individuals and groups (including non-formal and informal mobility), cooperation, social inclusion, equal access, creativity and innovation at the level of organization of education and training and youth policy, and including sports professionals and activities in the field of sports. It is also worth paying attention to the priorities set out in the Erasmus + program, i.e. the direction that the projects implemented under the program should take: inclusion and diversity, digital transformation, the environment and the fight against climate change, and participation in democratic life[32].

The Program involves the Member States of the European Union and third countries associated with the program, i.e. the Republic of North Macedonia, Iceland, Norway, Serbia, Liechtenstein and Turkey. All these countries are considered as Program Countries depending on the conditions of project implementation of the so-called partner countries[33].

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[30] Ibidem, p. 4.
[31] Ibidem, p. 6.
[32] Ibidem.
[33] Partner countries: Albania, Bosnia and Herzegovina, Kosovo, Montenegro, Armenia, Azerbaijan, Belarus, Georgia, Moldova, Ukraine, Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine, Syria, Tunisia, Russia, Andorra, Monaco, Vatican City, San Marino, Afghanistan, Bangladesh, Bhutan, China, Philippines, India, Indonesia, Cambodia, Democratic People's Republic of Korea, Laos, Maldives, Malaysia, Myanmar/Burma, Mongolia, Nepal, Pakistan, Sri Lanka, Thailand, Vietnam, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan, Argentina, Bolivia, Brazil, Ecuador, Guatemala, Honduras, Colombia, Costa Rica, Cuba, Mexico, Nicaragua, Panama, Paraguay, Peru, El Salvador, Venezuela, Iraq, Iran, Yemen, South Africa, Angola, Antigua

Adult education in Poland and the Erasmus + program

One of the sectors supported by Erasmus+ is the adult education. In the countries participating in the program, the implementation is carried out by the so-called National Agencies of the Erasmus+ Program. In Poland, this role belongs to the Foundation for the Development of the Education System (FRSE), which takes care of the indicated program. Organizations and institutions wishing to participate in the Erasmus+ program may apply for funding under several actions. Most of them (the so-called decentralized actions) are managed and implemented by the National Agency of the Erasmus + Program, i.e. FRSE. The implementation of the remaining ones is the responsibility of the European Commission – the Education, Audiovisual and Culture Executive Agency (EACEA) in Brussels.

The history of adult education in Poland with the support of European programs dates back to the program called Socrates, which was implemented in 2000–2006. One of its pillars was the Grundtvig program concerning non-professional adult education. Another educational program operating in 2007–13 called "Lifelong Learning" also included the Grundtvig program. Since 2014, the Erasmus+ program has been implemented, which co-finances, among others, activities in the field of non-professional adult education. However, within the Adult Education sector of the Erasmus+ program, and earlier the Grundtvig program, international cooperation projects funded adult education only in terms of non-professional adult education. Therefore there was no attention to improving professional competences of adults. The latter competences,

and Barbuda, Bahamas, Barbados, Belize, Benin, Botswana, Burkina Faso, Burundi, Chad, Democratic Republic of Congo, Democratic Republic of East Timor, Dominica, Djibouti, Eritrea, Eswatini, Ethiopia, Fiji, Gabon, Gambia, Ghana, Grenada, Guyana, Guinea-Biss au, Equatorial Guinea, Haiti, Jamaica, Cameroon, Kenya, Kiribati, Comoros, Congo, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Micronesia, Mozambique, Namibia, Nauru, Niger, Nigeria, Niue, Palau, Papua-New Guinea, Dominican Republic, Republic of Guinea, Central African Republic, Côte d'Ivoire, Cape Verde, Rwanda, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Samoa, Senegal, Seychelles, Sierra Leone, Somalia, Sudan, South Sudan, Suriname, Tanzania, Togo, Tonga, Trinidad and Tobago, Tuvalu, Uganda, Vanuatu, Cook Islands, Marshall Islands, Solomon Islands, São Tomé and Príncipe, Zambia, Zimbabwe, Saudi Arabia, Bahrain, Qatar, Kuwait, Oman, United States Arab Emirates, Australia, Brunei, Chile, Hong Kong, Japan, Canada, Macau, New Zealand, Republic of Korea, Singapore, United States of America, Taiwan, Uruguay, Faroe Islands, Switzerland, United Kingdom. See: *Erasmus + Program Guide*, Version 2 (2021), pp. 14-37.

on the other hand, may be the subject of projects in the Vocational Education and Training sector[34].

To help applicants choose the right sector, the European Commission has provided the following definitions in the Glossary[35] at the end of the Erasmus+ Program Guide: Adult Education, Adult Education Organizations and Adult Learner:

- Adult education – all forms of NVAE, both formal, non-formal and informal (for continuing vocational training see "Vocational Education and Training").
- Adult Education Organization – any public or private organization actively act in the field of NVAE.
- Adult learner – any person who, after completing education or training, or resigning from continuing such education or training, returns to some forms of continuous education or learning (formal, non-formal and informal learning), excluding teachers teaching in schools, teachers and trainers in the field of vocational education and training.

In this sector, the project implementer can be any organization dealing with this subject. The most enterprises are carried out by foundations and associations (the so-called third sector) – because they usually know the needs of their social environment. Among them are third age universities, popular universities, disability organizations and other organizations promoting lifelong learning. Cultural institutions also play an important role. Museums, libraries and community centers often function as centers of local activity and implement educational projects. The co-financing in the sector is also used by local governments, social welfare centers, general education schools for adults, pedagogical and psychological counseling centers, prisons, and even higher education institutions. The aim of the organization and the theme of the project are important – it must concern supporting non-professional adult learning[36].

Action 1 in this sector (Mobility of adult education staff) co-finances foreign mobility of employees, mainly educators or managers of adult education institutions. It is possible to attend courses, seminars and conferences, as well as to learn about a specific job by observing colleagues from other European organizations. Erasmus+ also finances trips to conduct classes for adult learners or trainings for adult education staff. Thanks to foreign trips, employees of educational institutions can

[34] A. Respondek, *Charakterystyka niezawodowej edukacji dorosłych w programie Erasmus+*, [in:] A. Respondek, M. Chodniewicz (eds.), *Oblicza niezawodowej edukacji dorosłych w programie Erasmus+*, Warsaw 2017, pp. 24-25.
[35] *Erasmus+ Program Guide*, Version 2 (2019), 2018, pp. 350-359.
[36] A. Respondek, *Charakterystyka niezawodowej…*, op. cit., pp. 24-25.

look at the learning process of adults from a completely new perspective, improve the quality of services offered by the parent organization and develop international cooperation, as well as improve language skills and increase knowledge about the culture of other countries. The projects in Action 1 are relatively easy to implement, therefore for many organizations they become the first step in international cooperation. Action 2, in turn, enables the implementation of projects in international partnership. In 2014-2020, two types of projects were supported: Strategic Partnerships focused on exchange of good practices, aimed mainly at establishing European cooperation and exchanging experiences, and Strategic Partnerships for Innovation, aimed at developing innovative products that can be widely used in adult education (for example, example of new curricula or educational tools). In Action 2, the scope of activities is wider than in Action 1. Apart from foreign trainings for the staff, meetings for partners are possible to organize aimed at exchanging experiences and working out joint results, as well as trips of adult learners.

Priority topics within the Adult Education sector of the Erasmus+ program tend to be actions in favor of disadvantaged and more difficult people in life, requiring educational support to improve their quality of life and inclusion in society[37]. Although adult education in the Erasmus+ program is called the smallest sector, the amount of funds for the implementation of projects within its framework, and thus the implementation of projects, has increased[38]. In the competitions organized in 2019, the number of submitted applications increased by 15%, and the number of projects approved for implementation increased by 58%. In action 1 and 2 of the application competitions in 2019, the sector received 229 applications, which placed Poland in the forefront of countries with the largest number of applications in the sector. In the year under review, co-financing was granted for projects in the adult education sector in the amount of EUR 123 456 789[39]. An important platform supporting the development of adult education in Poland (international one) is EPALE, an electronic platform for adult learning in Europe. EPALE is an online space where trainers and adult educators can find suggestions for new teaching methods. The platform is also a space for sharing ideas and inspirations. EPALE also organizes training courses, webinars, workshops, meetings and conferences[40].

[37] Ibidem.
[38] Erasmus+, Program Operacyjny Wiedza Edukacja Rozwój, Europejski Korpus Solidarności – Raport 2019, Fundacja Rozwoju Systemu Edukacji, Warsaw 2020, p. 50.
[39] EPlusLink base.
[40] Ibidem, p. 100.

Conclusions

Over the past decade, the concept of lifelong learning has become a key issue in international education programs. It carries a clear message. It claims that learning can and should be a lifetime activity. This approach to learning provokes a fundamental question whether the learning process depends on the age of learner[41]. Our perception of learning changes radically if we recognize that the process of social interaction is a necessary and closely related learning process. Many contemporary theorists of learning think similarly, and there are some for whom learning is only a socially constructed process[42]. It seems obvious to state that the quality of relationships with social environment changes significantly throughout our lives. This relationship is completely different in the case of a completely addicted newborn to an adult, and it is different when we are dealing with a teenager striving for independence, or young adults building their autonomy to finally take on another form of addiction that comes with old age. The nature of the above-mentioned developmental changes significantly influences the social dimension of human learning[43].

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[41] K. Illeris, *O specyfice uczenia się ludzi dorosłych*, „Teraźniejszość-Człowiek-Edukacja" 2009, no. 1(45), p. 85.

[42] See: J. Lave, E. Wenger, *Situated Learning: Legitimate Peripheral Participation*, New York 1991; K.J. Gergen, *Realities and Relationships*, Cambridge 1994.

[43] K. Illeris, *O specyfice*..., op. cit., p. 86.

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Olena YATSENKO*

VALUE-BASED EDUCATION: PHILOSOPHICAL DIMENSION AND CURRENT PUBLIC REQUEST

Modern Ukrainian society is in a transitional state of implementing European values of freedom and democracy, liberal economy and quality education, conscious use of resources and environmental priority in production and consumption[1]. According to a well-known scholar and leader of The World Values Survey R. Ingelhart, the development of democracy is inherent in societies where the demand for freedom outweighs the existing institutional supply, or where civil society activity provides transparency, publicity and accountability to government[2]. As the SOCIS poll conducted in the spring of 2015, there is a worldview axiological transformation in Ukraine: the values of self-realization as a prerequisite for the effectiveness of a democratic system prevail in public opinion over the values of survival, which are inherent to authoritarian communities[3].

This transition was also accepted at the state level in the Strategy of Sustainable Development of Ukraine until 2030, the Decree of the President of Ukraine "On the Goals of Sustainable Development of Ukraine until 2030"[4] and others. These documents state that sustainable development means a change in values, namely the priority of the values of freedom, equality, solidarity, tolerance, respect for nature and shared responsibility. Such transformations ensure not just the European and

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[1] V.P. Andrushchenko, T.V. Andrushchenko, V.L. Savel'yev, *Constitutionalization of the educational space of Europe: axiological dimension*, „MP Lesya", Kyiv 2017.

[2] L. Parashchenko, V. Hromovyy, *Back and forth to values-based education (values-based education)*, http://education-ua.org/ua/articles/812-upered-nazad-do-osviti-yaka-gruntuetsya-na-tsinnostyakh-values-based-education [10.09.2021].

[3] Y.A. Hrytsak, *Values of Ukrainians: pro et contra reforms in Ukraine*, http://zbruc.eu/node/37721 [11.09.2021].

[4] *Decree of the President of Ukraine. About the Sustainable Development Goals of Ukraine for the period up to 2030*, https://zakon.rada.gov.ua/laws/show/722/2019#Text [11.09.2021].

world integration of the state, but also the provision of a high standard of living in the country, the development of the economy, culture, education, and the preservation of the ecosystem. State reforms in the field of education in Ukraine are aimed at building the future of the nation, and special emphasis is placed to values-based education. Therefore the question arises about the philosophical discourse of values, its social attribution, the cultural context of formation and the local context of implementation. This problem is especially relevant for our country because of so-called "Russian peace" ideology, which caused both internal social tensions and became a pretext for justifying external aggression. In other words, the monologue educational practices inherent in the Soviet totalitarian model of social order are not just outdated and ineffective for modern Ukrainian society, but also dangerous.

The Drahomanov University became the executor of two international research projects – the Jean Monnet Department "Social and Cultural Aspects of European Studies", 620635-EPP-1-2020-1-UA-EPPJ MO-CHAIR and the Jean Monnet Project "EU Values of Diversity and Inclusion for Sustainable Development", 620545-EPP-1-2020-1-EN-EPPJMO-PROJECT in 2020. These projects provide opportunities for the research and dissemination of European values and successful practices of their promotion in training courses on intercultural dialogue, European social cohesion policy, EU cultural policy and others.

Philosophical problem of value

The philosophical problem of value has a long and meaningful history of formation and development. Different approaches to determining value could be revealed in four main categories: ideology, motivation, unification and suggestion. We accept a universal definition of value as a certain worldview principle, which in forms and contents determines the general matrix of mental processes of consciousness, ways of perception and evaluation of reality, the concept of meaning and understanding in the communication process.

Category of ideology. Value as a worldview principle means the procedure of establishing a logical emphasis, differentiating the essential and important from changing and spontaneous processes and phenomena, or in other words, produces the ideological basis of self-awareness.

The category of motivation means the extrapolation of worldview ideals and principles into the pragmatic dimension of human activity. Value is the cause and purpose of human action, regardless of what constitutes their content and meaning.

The category of unification means the evolutionary mechanism of transformation into a single standard of verification and evaluation of objects and processes, as well as the criteria of their relationship both with each other and with a certain ideal, pattern, standard. It is the idea of values that unite society, shape public opinion and the deontic principles of the social order.

The category of suggestion in determining value receives legitimization and special influence in a liberal economy. In this perspective, the phenomenon of value means individual moral and emotional satisfaction from the observance of value-semantic ideals and principles, as well as public approval and encouragement of appropriate judgments and actions.

The general context, the semantic field of accumulation and translation of value is culture. Culture is an intellectual product in which various individual, egocentric interests and aspirations are transformed into common goals and priorities of coexistence and development. Such a transformation is realized through compromise, dialogue and interaction in various aspects of public life. Therefore, value can reasonably be seen as the basis of responsibility: to yourself, your loved ones, the community and the planet as a whole.

Implementation of the strategy of sustainable development involves a change of value priorities, transformation of cultural models and algorithms of life. At the heart of this desire is the idea of the locality of human existence, the belief in the need to preserve the planet for present and future generations. The philosophical problem of space, or localization as a technique of definition and interpretation, is effective both in the study of the phenomenon of value (its genesis, distribution, influence, modifications) and in elucidating the possibilities and ways of influencing social transformations.

The concept of universal values is quite problematic, because each culture creates and affirms its own axiological models of human life. Accordingly, values are also in some way 'localized' within a certain culture, worldview, way of thinking and acting. Values are a kind of localization the basic principles of a particular culture. The content of values generates a "cartography" of society, i.e. justifies and legitimizes the complexity and hierarchy of social organization.

In a complex and unstable modern society, "Moreover, we also have a huge amount of economic literature on costs and benefits, risks, how to monetarize ecological values, discounting, etc. More recently, debates on corporate sustainability or on corporate responsibility have drawn attention to both the possible and the expected contribution of business to sustainable development and to corporate responsibility to

achieve a just society"[5]. Correctly said, "Sustainability assessments are thought to provide information for societal agents. They should function as steering instruments for decision-making. However, they will only be able to fulfil this task if they are adjusted to the action spaces of relevant stakeholders. In other words, sustainability assessments not only face difficulties concerning assessment criteria – what type of values should be considered – but also need to be adjusted to what stakeholders are actually able to decide upon. Hence, agents, structures, action spaces, cultural frames, and especially values enter the field not only in analysis of means to achieve more sustainable societies but also within the domain of establishing tools and methods for sustainability assessments"[6]. Therefore, we need to clarify the problem: how to implement the deontology of value in the praxeology of social life?

The perfection of the individual, the cultivation of kindness and beauty, justice and truth, etc. as the foundations of folk and written culture, literature and art have always been based on the ideas of constructive, physical, mental, and spiritual work[7]. And this is the mission of education.

Indeed, education is a vital strategy for integrating the younger generation into the socio-cultural community. But education is not a blind imitation of established patterns of knowledge, behavior, and assessment of the surrounding reality. Education both in the context of teaching and in the process of its acquisition is a creative self-realization of the individual. And the central aspects of creativity are appropriately called freedom of will and social responsibility[8]. The creative process is directly related to the meanings and values that society professes, because the latest ideas can be supported or condemned by the community. Accordingly, the feeling of belonging to the community, the need to focus on the opinion of others, forms the principles of social responsibility. This approach to understanding education is productive given the need for a balance between initiative and responsibility, individualism and empathy, the implementation of the principles of inclusion and multicultural interaction.

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[5] P. Burger, C.-H. Daubb, Y.M. Scherrerb, *Creating values for sustainable development*, „International Journal of Sustainable Development & World Ecology" 2010, vol. 17, no. 1, p. 1.

[6] Ibidem.

[7] C. Corbu, *Culture and sustainable human development*, „Higher Education in Europe" 1995, vol. 20, Issue 4, pp. 168-169.

[8] L. Tanggaard, *Creating together – moving towards a 'we-paradigm' in educating for creativity*, "Multicultural Education Review" 2020, vol. 12, Issue 1: *Danish Experiences of "Togetherness" and Its Implications for Multicultural Education*, pp. 4-16.

In today's globalized world, which is developing extremely rapidly under the influence of new technologies, there are opinions about the value of universities in terms of economic and social development. Modern society as a whole is characterized by a crisis of trust. Similarly, a crisis of trust we could notice in the activities of students, their parents, future employers, general publicity[9]. The problem is that performing the function of training is not enough to understand the mission of a modern university. The market paradigm of education must be complemented by value aspects. With such a combination, the evaluation of the university's activities by the community will change the criteria and indicators of success, as economic factors of public life do not provide an adequate response to modern problems and challenges. The university cannot function autonomously to society, guided by the principles of economic feasibility and production necessity. That's not enough. The mission of a modern university is socially oriented, involves the approval and dissemination of socially defined goals and values.

World rankings of modern universities are determined by criteria of quality of education, level of research, success of graduates in the labor market and indicators of international cooperation[10]. However, these criteria are inherent in the economic sphere of public life and provide little information about the social mission of the university[11]. Such initial ranking data are far from the proclaimed principles of sustainable development and the values of a modern democratic society.

The emergence and evolution of values in the educational environment reveals the mechanisms of their internalization by individuals and the socialization of personalized values and meanings[12]. Recognized by society epistemological, ethical and aesthetic regulations in the educational process undergo the procedure of identification and verification, comprehension and testing in life situations. Accordingly, value-oriented education involves and the learning process of students, and also the development of creativity and critical thinking.

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[9] G.W. McClung, M.W. Werner, *A Market/Value Based Approach to Satisfy Stakeholders of Higher Education*, "Journal of Marketing for Higher Education" 2008, vol. 18, Issue 1, pp. 102-123.

[10] *World Values Survey*, http://www.worldvaluessurvey.org [10.09.2021].

[11] H. Spitzeck, C.P. Siegenthaler, *Value-driven and Stakeholder-based Ranking – A Closer Look at Evaluating "Education for Sustainable Development"*, "Higher Education in Europe" 2007, vol. 32, Issue 1: *Higher Education Ranking and its Ascending Impact on Higher Education*, pp. 49-57.

[12] J. Garrison, L. Östman, M. Håkansson, *The creative use of companion values in environmental education and education for sustainable development: exploring the educative moment*, „Environmental Education Research" 2015, vol. 21, Issue 2, pp. 183-204.

The pragmatism of economic expediency in the activities of a modern university reflects the priority of technocratic models of the connection of education and science with society[13]. The pragmatism of technocracy is designed to address the practical issues of production and distribution of public goods. However, the effectiveness of a modern university is not limited to traditional indicators of qualification, trust and legitimacy[14]. Thus, there is a clear and sustainable social demand for values-based education.

Values-based education

Values are the main drivers of human behavior, and they are the focus of all social innovation, particularly in education. The fundamental principle of value-based education is communication, the combination of individuals in a shared vision, aspirations and actions. Such unity is possible under the condition of mutual trust, respect and a sense of security. In this way, education is an effective means of orientation in the semiotic-semantic field of culture, the formation of the necessary topological skills in the information sphere of modern culture. In other words, education is a tool for managing and making informed decisions.

The reason for discussions about the content of values that should be enshrined and transmitted by education is rightly called the erroneous desire to separate objective facts from subjective assessments[15]. Technocratic instrumentalism is ambiguously correlated with liberal and democratic values. It seems wrong to think about the objective nature of the humanities, i.e. values, education and professional or competence. Any practice, professional or not, is the embodiment of such patterns and priorities created and replicated by the community. Professional activity is not carried out separately and independently of sustainable life strategies. Accordingly, value-oriented education is a complex and systemic phenomenon, rather than a local manifestation of the corrective effect on students.

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[13] F. Amador, A.P. Martinho, P. Bacelar-Nicolau, S. Caeiro, C.P. Oliveira, *Education for sustainable development in higher education: evaluating coherence between theory and praxis*, „Assessment & Evaluation in Higher Education" 2015, vol. 40, Issue 6: *Assessing and Evaluating Sustainable Development in Higher Education*, pp. 867-882.

[14] B. Broucker, K. De Wit, J.C. Verhoeven, *Higher education for public value: taking the debate beyond New Public Management*, „Higher Education Research & Development" 2018, vol. 37, Issue 2, pp. 227-240.

[15] J. Halliday, *Values and further Education*, „British Journal of Educational Studies" 1996, vol. 44, Issue 1, pp. 66-81.

The importance of values in education is relevant not only to the content and quality of education. Existing positive and friendly relationships, atmosphere of cohesion and trust stimulate children's creative and cognitive abilities, motivate for better learning outcomes, namely form the desire for 'intellectual depth', 'self-reflection' and 'communicative competence'[16]. Such observations provide grounds for rethinking the strategies of the educational process with a focus on the well-being and progress of students in learning and development.

Transformation of personality, its principles, views and beliefs is possible on the basis of internalization and recognition of values[17]. Integration into society is a transaction from non-knowledge to us-knowledge and acceptance of the ideals and goals of the community.

That is why, Ukraine needs value-based education[18]. And in this sense, the contradictions between the sustainable localization of values at the level of individual, countries, communities, institutions do not mean insurmountable obstacles to Sustainable development. Democratic values of cultural diversity and inclusion, trust and responsibility, social cohesion and creative self-realization must go through a transformation from abstract principles to specific regulations and techniques of pedagogical activity in Ukrainian society. It is a way of dialogue, wide public discussion of the content, format, quality assurance system of education, etc.

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[18] V.M. Zavhorodnya, A.M. Kulish (eds.), *Tsinnisno-oriyentovanyy pidkhid v osviti i vyklyky yevrointehratsiyi: mater. mizhnar. nauk.-metod. konf.* (Sumy, 29-30 travnya 2020), Sums'kyy derzhavnyy universytet, Sumy 2020.

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Denys SVYRYDENKO*

UKRAINIAN HIGHER EDUCATION AS AN INSTRUMENT OF PEACE-BUILDING STRATEGY

Ukrainian higher education has been modernized in recent years, gradually transiting to the European Higher Education Area. This process is complicated by the dominance of narratives of educational efficiency in the Soviet era rooted in national educational traditions. Naturally, in recent years, the higher education system has experienced global challenges caused by the need to transit to the economy of Industry 4.0 and the search for effective development strategies in the context of the COVID-19 pandemic. These challenges are global and affect every national higher education system.

At the same time, these educational systems can have severe challenges at the national level. Distancing from these challenges in favor of the global ones is counterproductive. For Ukrainian higher education, such a challenge reveals in the need to consider the implementation of the peace-building strategy in response to the hybrid military aggression that has been taking place in the socio-cultural space since 2014. This study does not offer thorough (including empirical) arguments for the importance of global and national challenges to the development of Ukrainian higher education. The study attempts to emphasize the multivector nature of modernization processes, to warn the academic environment against the excessive shift of the research focus from the national dimension of modernization of higher education.

As a result of hybrid military aggression, the Ukrainian landscape of higher education is divided. In particular, due to the relocation of 18 universities from certain districts of the Donetsk and Luhansk regions and the Autonomous Republic of Crimea, significant regions for the Ukrainian economy have lost human capital and disrupted personnel training for the labor market. The following statement can illustrate the problem: “The current situation at the Donbas labor market can be defined as critical. Changes in the structure of demand and supply that have arisen in the military conflict background have caused an exacerba-

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tion of the existing problems and the emergence of new ones that have not been known in management practice before"[1].

In addition to the current challenges to Ukrainian higher education and the economy, educators face the problem of reintegrating the educational landscape and preventing military conflicts in the future: "The restitution of the Crimea and some territories of Donetsk and Luhansk regions under the control of Ukrainian government will cause the need of reintegration of all the economic spheres as well as social ones. Among others, it is extremely important to reintegrate the educational system including higher education. Unfortunately, there are no scientifically substantiated strategies as well as specific steps to be performed for reintegration"[2]. The vast majority of Ukrainian and foreign research does not offer a strategy to overcome the current situation. The mentioned situation in Ukraine demonstrates the untapped potential of higher education in ensuring the development of a peaceful society.

The Ukrainian socio-cultural situation actualizes the search for strategies for developing higher education as a tool for peace-building. The UNESCO Constitution of 1945 contains the following statement: "That since wars begin in the minds of men, it is in the minds of men that the defences of peace must be constructed"[3]. In this study, we would like to emphasize the need to develop a conceptual model of Ukrainian higher education as a tool for peace-building strategy. Mentioned practically oriented model should be conceptualized with the corresponding possibility of its implementation in actual educational practice. This approach is not only a practice-oriented attempt to resolve the contradictions of the development of Ukrainian education in the current sociocultural environment. It also meets the principle of "Science with a mission" (Horizon Europe), which laid down as a value horizon for European research.

Students of Ukrainian universities with experience in higher education aimed at developing a culture of peace will be able to help to solve the next complex problem: "In the context of the hybridization of warfare, safe spaces disappear, academics and students become vulnerable to unexpected attacks from actors claiming authority. Conflicts of identi-

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[1] S. Terepyshchyi, D. Svyrydenko, K. Zakharenko, K. Bezgin, O. Kulga, *Evaluation of Donbas universities' economic potential: problems of personnel training and unemployment,* "Naukovyi Visnyk Natsionalnoho Hirnychoho Universytetu" 2019, Issue 5, p. 149.

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[3] *UNESCO Constitution 1945*, http://portal.unesco.org/en/ev.php-URL_ID=15244&URL_DO=DO_TOPIC&URL_SECTION=201.html [09.10.2021].

ty and belonging increase in spaces where disinformation is amplified through the internet and social media. Under the pressures of fake news and fabrication of data, scientific approaches to the investigation of social problems are doubted, and stakeholder consensus is harder to achieve"[4].

Several factors add relevance to these theoretical searches, among which the following are essential:

- lack of comprehensive research on the implementation of foreign experience in peace-building in Ukrainian educational policy;
- theoretical principles and practical mechanisms of reconciliation in the Ukrainian educational space have not been developed;
- there are no initial programs in peace-building for students of higher educational institutions;
- in the current curricula of the cycle of socio-humanitarian disciplines, not enough attention is paid to the issues of prevention of military conflicts and reintegration of the temporarily occupied territories.

Problem Statement

The authors hypothesize that Ukrainian higher education is not adapted to the conditions of a hybrid war. In the current conditions of hybrid confrontation on Ukrainian territory, there is a struggle between two antagonistic discourses: the expansion of the colonial ideology of the 'Russian world' (Russian Federation) and peaceful coexistence (Ukraine). Moreover, the main field of confrontation is the humanitarian one, including its segment of higher education. The Declaration on the Promotion among Youth of the Ideals of Peace, Mutual Respect and Understanding between Peoples, adopted in 1965 at the 20th session of the UN General Assembly, is still relevant. These provisions emphasize the need to pay special attention to improving the system of pedagogical training, curricula, the content of textbooks and classes, improvement of other educational materials, and new educational technologies to educate responsive and responsible citizens open to different cultures capable of valuing freedom, respect human dignity and individuality, prevent conflicts or resolve them by non-violent means[5].

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[4] A. Oleksiyenko, S. Terepyshchyi, O. Gomilko, D. Svyrydenko, *'What Do You Mean, You Are a Refugee in Your Own Country?': Displaced Scholars and Identities in Embattled Ukraine*, "European Journal of Higher Education", doi: 10.1080/21568235.2020.1777446 [14.10.2021].

[5] *Declaration on the Promotion among Youth of the Ideals of Peace, Mutual Respect and Understanding between Peoples. UN. General Assembly 1965*, https://digitallibrary.un.org/record/57721?ln=ru [23.10.2021].

On the agenda of the discourse of the Ukrainian educational philosophy, several issues fit into the general methodological framework of finding tools to overcome current military threats and to prevent their occurrence in the future. These issues acquire a specific conceptual design, given the problem of disintegration of educational and scientific space of Ukraine (some institutions remained in the temporarily uncontrolled territory of Ukraine; some institutions 'evacuated' in part to controlled areas). A separate issue is the that of the productive reintegration of educational space. For many years, education and science have demonstrated its own distance from the challenges of military conflict – education has not become a tool for establishing the values of peace-building. It has not worked to develop the ideals of critical thinking, able to counteract the informational effects of propaganda, etc.

Analysis of the sources shows an almost complete lack of scientific discussion on the role of higher education in peace-building in Ukraine. The available research offers theoretical mechanisms of pacification without a step-by-step strategy of restoring territorial integrity and perspective reintegration of divided spheres of Ukrainian society. Some foreign and domestic studies suggest their models of peace-building. However, these works are primarily descriptive in nature, stating the current state of affairs without offering a roadmap for peace-building. In addition, foreign studies describe reconciliations in other countries, such as the Israeli-Palestinian conflict, which contain valuable analysis, but it cannot be fully transferred to our socio-cultural situation. Also, such investigations do not consider the peculiarities of the hybrid confrontation in Ukraine in 2014-2021.

Questioning the possibilities of the Ukrainian higher education in peace-building strategies

The importance and relevance concerning strategies for disclosing peace-building potential by Ukrainian higher education is provided by an alarming trend, to which Julia C. Lerch and Elizabeth Buckner (2018) draw attention. As a result of the discourse analysis in the field of peace-building and UNESCO documents for the period 1945-2015, the authors pointed out that education has been increasingly understood not as a tool to prevent military conflicts but to overcome them. Education has begun to lose its anticipatory potential. It has been intertwined with the social structure of societies in conflict. "Recent years have witnessed a dramatic rise in academic and professional interest in education in fragile and crisis-affected contexts among the international education community (...). The development of this new sub-field, frequently referred to as 'education in emergencies', has been reflected in the striking

growth of new organisations, networks, and funding streams, as well as publications and training programmes, all dedicated to promoting young people's education in situations of conflict and emergency. And yet, the new field of education in emergencies has largely developed outside of its older cousin and alongside the earlier focus on education for peace a newer focus on protecting education from conflict and crisis has emerged"[6].

Our study is an overview of the 'agenda' of the problem of peace-building tools of higher education. A holistic strategy can be formed by implementing and summarizing the results of the following research tasks:

1. Analysis of international and domestic regulations on peace-building.

2. Generalization of the achievements of Ukrainian and foreign scholars on the cessation of conflicts and reconciliation in society through higher education. At the same time, it should be borne in mind that the hybrid war in Ukraine has no direct analogs, so it is illegal to transfer the work of other scientists to the Ukrainian situation without adaptation.

3. Development of a holistic model of using Ukrainian higher education as a tool for peace-building and substantiation of recommendations on the practical steps of its implementation for public authorities, local governments, educational institutions.

4. Development of training courses on the basis of peace-building for students of all specialties.

5. Development of separate educational modules (topics of classes) for curricula of disciplines (Political Science, Law, History of Ukrainian Statehood, Philosophy, Philosophy of Education, Educational Policy), which would cover issues of peace-building in Ukrainian conditions.

Substantiation of the conceptual model of Ukrainian higher education as a tool of peace-building is proposed to be based on a poly-methodological approach, which should fruitfully use the methodology of modern social studies (educational policy, cultural studies, history, law, political science, etc.). In particular, the approaches to the theory of hybridity and postcolonialism as part of globalization studies are heuristic for analyzing the current socio-cultural situation in Ukraine, the explication of the essence and explicit content of military threats, taking into account the future risks.

[6] J.C. Lerch, E. Buckner, *From education for peace to education in conflict: changes in UNESCO discourse, 1945–2015*, "Globalisation, Societies and Education" 2018, no. 16(1), p. 27.

We want to dwell in more detail on the need to cover the issues of peace-building in teaching a wide range of disciplines of social and humanitarian orientation. The potential of this approach, in particular, is based on a preliminary study of the possibilities of these disciplines (Political Science, Law, History of Ukraine, Philosophy, Philosophy of Education, Educational Policy, etc.), as well as prevalent in the discourse of education for peace-building approach proposed by Reina Zenelaj Shehi, Salih Ozcan and Timothy Hagen (2018). The authors emphasize the following: "Peace education is both a philosophy and a process (...) The philosophy of peace education is to teach love, compassion, non-violence, and reverence for all life and is premised on the assumption that humans, while imperfect, are able to live in peace (...) The process of peace education involves empowering people with the skills, attitudes, and knowledge for creating and sustaining a peaceful world environment (...). Despite its apparent value, peace education is often marginalised in academic and professional groups (...). One strategy that may overcome the marginalization is to incorporate peace education into other disciplines and thereby develop a peace education orientation throughout other curricula"[7].

As an example of the implementation of peace-building strategy in universities, Kevin Kester and Hilary Cremin (2017) give the following example, in which the approaches of legal sciences, political sciences, philosophy, etc. are fruitfully used at the multidisciplinary level: "Peace studies grew out of teaching and learning about war and peace agreements; analysis of peace and security organizations; and the study of leaders of peace movements, such as Mahatma Gandhi, Martin Luther King, and Aung San Suu Kyi"[8]. This approach was used in an adapted form by us in developing the principles of updating the curricula of Ukrainian universities to open up opportunities for building peace and overcoming the existing challenges of hybrid military aggression in Ukraine.

Considering peace-building in the socio-humanitarian training courses, the following topics are proposed:

- "Political Science" Course (postcolonial and post-totalitarian theories; the theory of transit societies; review of political mechanisms to ensure the practice of peace-building);

[7] R. Z. Shehi, S. Ozcan, T. Hagen, *The Role of Higher Education Institutions in Building a Culture of Peace: An Albanian Case*, "Journal of Peacebuilding & Development" 2018, no. 13(1), pp. 47-48.

[8] K. Kester, H. Cremin, *Peace education and peace education research: Toward a concept of poststructural violence and second-order reflexivity*, "Educational Philosophy and Theory" 2017, no. 49(14), pp. 50.

• "Law" Course (review of international and Ukrainian legislation in the field of peace-building; analysis of the actual state of ensuring the principles of peace-building in accordance to the law);

• "History of Ukrainian Statehood" Course (review of the problems of historical manipulation and substitution of historical narratives; revival issues and preservation of national memory);

• "Philosophy" Course (issues of development of critical thinking and worldview; review of philosophical theories of non-violent interaction (Gandhi, etc.), philosophical problems of war and peace (Sun Tzu, K. von Clausewitz, etc.), the potential of futurology (social synergetics, Roman Club, etc.) to predict social conflicts);

• "Philosophy of Education" Course (dialectics of global and local in the 21st century in education; multiculturalism in education; media literacy as one of the educational ideals, etc.);

• "Educational Policy" Course (domestic and international experience of educational peace-building; the phenomenon of the displaced universities in Ukraine and educational policy for them; modern educational policy to support the entry of persons from temporarily uncontrolled territories of Ukraine, etc.).

Education for peace-building is not a separate academic discipline but a holistic philosophical approach based on the use of science tools to generate and disseminate knowledge. Supposing that educational process provides time for mastering the finished material in the form of standardized knowledge and research practices, such education occasionally contributes to peace-building, preventing manifestations of indoctrination and manipulation. After all, people with developed analytical skills cannot afford to take any information for granted without verification and manifestations of critical thinking. Accordingly, the difference between an average student and a research student is that the former learns through a popular consumption strategy in modern society, focusing on memorizing existing knowledge in the finished form. The second demonstrates not so much the desire for comfort as a manifestation of natural curiosity in searching for answers by research on hitherto incomprehensible to humankind's questions[9].

We consider scientific education in a broader context – not only as a means of developing the scientific potential of the state by preparing a new cohort of scientists but also as a tool for harmonizing public relations and ensuring peace. Due to the intensification of cognitive processes and the implementation of analytical practices in the educational

[9] Д. Свириденко, Г. Хоменко, Ю. Александрова, *Філософська концептуалізація наукової освіти як інструмента миробудівництва*, "Освітній дискурс: збірник наукових праць" 2020, no. 26(9), p. 59.

space, a person is trained in three social representations: a harmonious person, a responsible citizen, and a competitive specialist. It is a person with a developed critical thinking and scientific worldview which is able to: resolve social conflicts in a non-conflict way; understand preconditions and consequences of social (including military) conflicts; be able to verify the content of messages received from the media, etc.

Conclusions

Understanding the urgency of overcoming the challenges of Industry 4.0 and the global pandemic of COVID-19, we emphasize the fact that modernization of Ukrainian higher education also requires special research attention to the problem of implementing a peace-building strategy while studying at universities. This aspect is exacerbated by the challenges of hybrid military aggression in the current Ukrainian realities. The study demonstrates the "agenda" of modernizing Ukraine's higher education in the context of revealing its potential for peace today and in the future.

The possibilities of changes in the curricula aimed at reflecting the problems of peace-building in the educational process within social and humanitarian courses were substantiated ("Political Science" Course (postcolonial and post-totalitarian theories; political mechanisms to ensure the practice of peace-building, etc.); "Law" Course (international and Ukrainian legislation in the field of peace-building, etc.), "History of Ukrainian Statehood" Course (historical manipulation and substitution of historical narratives, etc.); "Philosophy" Course (development of critical thinking; philosophical theories of non-violent interaction, philosophical problems of war and peace, etc.); "Philosophy of Education" Course (dialectics of global and local in the 21st century in education; media literacy as one of the educational ideals, etc.); "Educational Policy" Course (Ukrainian and international experience of educational peace-building, the phenomenon of the displaced universities in Ukraine and educational policy for them, etc.)). It has also been shown that disseminating the principles of science education helps to shape students' scientific thinking style (critical thinking, analysis of professional and everyday problems through fact analysis, etc.), which helps to counteract information influences (propaganda, fake news, etc.) in the context of hybrid military aggression.

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UNESCO Constitution 1945, http://portal.unesco.org/en/ev.php-URL_ID=15244&URL_DO=DO_TOPIC&URL_SECTION=201.html.

Свириденко Д., Хоменко Г., Александрова Ю., *Філософська концептуалізація наукової освіти як інструмента миробудівництва*, "Освітній дискурс: збірник наукових праць" 2020, no. 26(9), pp. 49-61. doi: 10.33930/ed.2019.5007.26(9)-5.

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THE PROBLEM OF THE QUALITY OF HIGHER EDUCATION IN THE CONTEXT OF KNOWLEDGE MANAGEMENT

The central problem of reforming higher education is to improve its quality. On the website of the Ministry of Education and Science of Ukraine, 'quality of education' is defined as "a set of characteristics of the educational process, which determines the consecutive and practically efficient form of competence and professional knowledge"[1].

In modern research, education is regarded as a behavioral model. For example, in the study "The regulatory functions of education in behavioral models"[2], the authors investigated three key education functions: formative, developmental and stabilizing. The regulatory functions of education allow considering the development of an individual, family and society as a behavioral model. Modeling of education, ranging from individual education to the educational policy of the country, opens up the possibility of implicating modern management theories and approaches into the educational process. Any managerial model that has proven to be effective in production finds application in the management of education institutions.

Education is regarded in modern theories as a behavioral model, which uses managerial models that have proven their effectiveness. Therefore, the reform of the quality of education essentially means a change in the managerial model in education. It affects the functions of education and the entire behavioral model of the neurobiological and social system. The implications of a new managerial model in education can lead to the crisis of personality identity[3]. For this reason, the quality

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[1] Ministry of Education and Science of Ukraine, 2019, https://mon.gov.ua/ua/ tag/ yakist-osviti [10.09.2021].

[2] O. Horban, O. Kravchenko, R. Martych, N. Yukhymenko, *The regulatory functions of education in behavioral models*, "Naukovyi Visnyk Natsionalnoho Hirnychoho Universytetu" 2019, no. 3, pp. 152-157.

[3] S. Balinchenko, *Mythologeme-Related Crisis of Identity: Reality and Fictional Markers of Alienation*, "Future Human Image" 2019, no. 11, pp. 5-13; Z. Kieliszek, *National Identity as an Important Topic of the Research of the Man in the Future: "Opening"*

of education and the meanings implied by this phrase acquire special significance. They determine the functions of education, i.e. management model in education, which forms the basis of human and society behavior.

Considering the definition of 'quality of education' of the Ministry of Education and Science of Ukraine, the following can be found out: it "(...) determines the consecutive and practically efficient form of competence and professional knowledge"[4], that clearly reveals the only meaning. This phrase indicates the choice of direction of management reform, or a certain sequence of actions aimed at building competencies and transferring certain professional knowledge.

Educational policy of the leading countries of the world, especially in the direction of changing the 'quality of education', i. e. management in educational models, is determined by the programs, regulations and legal documents adopted by the Educational, Scientific, and Cultural Organization (UNESCO). These are the directives of this organization that are the basis for a variety of international educational forums, such as Global National Education Leadership Summit, Higher Education Forum, K12 Education, International Education, Quality and Specialty Education, Online Education, Preschool Education Forum, and others. These forums are platforms for discussing the features of implications of management models in education and science, as well as their use as a nominal or real force in the educational policy of countries[5].

The term 'quality of education' used by the Ministry of Education and Science of Ukraine, and in accordance with which it implements the reforms of the management of higher education institutions, does not convey the true scale of modern modeling of the educational process. In addition, the term does not reveal the true capabilities of management models that are used in modeling the educational process.

In the educational policy of the world's leading countries, the quality of education as well as the reform of higher education management is defined by another term – 'total quality management'. The implications of this term in educational policy provides for reforming the management of higher education institutions based on international experience.

The implications of total quality management in educational management began at the end of the twentieth century. They involved the

the Potential of the Fichtean an Concept of National Identity, "Philosophy and Cosmology" 2018, no. 20, 83-91.

[4] Ministry of Education and Science of Ukraine, 2019, https://mon.gov.ua/ua/tag/yakist-osviti [10.09.2021].

[5] O. Horban, T. Kuprii, R. Martych, L. Panasiuk, *Implications of total quality management in Ukrainian higher education institutions: international experience*, "Naukovyi Visnyk Natsionalnoho Hirnychoho Universytetu" 2020, no. 2, pp. 126-130.

creation and implementation of systematic programs in educational policy that viewed an educational institution as a comprehensive organization. The introduction of the new management method ensured continuous improvement of each member of the organization and the entire organization as a whole.

The implications of total quality management in education consist of two somewhat different, but generally related processes. The first is the adoption of the philosophy of continuous improvement of the educational process that reveals a new vision of managing an organization. The second is the mastery of a set of practical actions that consists of tools and methods aimed at promoting continuous improvement. For example, Edward Sallis in the book "Total Quality Management in Education" revealed the implications of total quality management in organizing the scientific process. E. Sallis showed that the implications primarily affect the management of educational institutions, since it is a new philosophy and methodology of management. Managing requires not only knowledge of the features of total quality management. It should also acquire practical skills that include new approaches to address organizational, leadership, and teamwork issues[6].

The implication of total quality management in higher education management involves a shift from short-term expediency to long-term quality improvement. In fact, it is a return to the meaning of ancient paideia, when a teacher was regarded not as a bearer of knowledge, but as a mentor and guide to life. The teacher defined the student's way of life, forming his/her involvement not only in current life processes. The teacher ascended with the student to the image of a higher idea or to universal consciousness[7].

S. Sahney claims that to achieve the competitiveness of educational institutions, as well as to survive and succeed in the long run, the implications of total quality management is a prerequisite. Focusing on engineering and administration institutes, S. Sahney tried to develop an integrated and customer-centered model of quality management in education through the use of several methodologies to evaluate the service quality. S. Sahney placed major emphasis on improving the service and developing educational services by incorporating the voice of the customer[8].

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[6] E. Sallis, *Total Quality Management in Education*, (3rd ed.), Routledge 2014.

[7] V. Bilyk, I. Sheremet, *A New View of the Nature of Reality and the Teaching Higher-Level Cognitive Strategies*, "Philosophy and Cosmology" 2019, no. 22, pp. 92-100.

[8] S. Sahney, *Use of multiple methodologies for developing a customer-oriented model of total quality management in higher education*, "International Journal of Educational Management" 2016, no. 30(3), pp. 326-353.

In general, the implication of total quality management in higher education management involves the following steps:

1. The process of managing a higher education institution. It includes strategic planning; recruitment and training of staff; providing resources and agreeing on what they teach, how they teach and how they assess learning outcomes. E. Psomas and J. Antony studied the implications of total quality management in 15 private higher education institutions in Greece. The evidence of the results of these implications proves once again the effectiveness of this method of management in the growing competition in the market of educational services[9].

2. The process of improving the quality of teaching. Students are viewed as buyers of educational services and at the same time as participants in the educational process. Administrators involve students in their own education, teaching them to evaluate the learning process and accept responsibility for their learning. According to the study of L. Hickman and M. Akdere, about a third of US voters believe that colleges and universities have a negative impact on the nation, demonstrating that quality assurance is not pursued in higher education. The authors show how the combination of Stakeholder theory and Total Quality Management change the practices in the context of the US educational policy[10].

3. The process of improving the quality of organizing the work of employees. The staff working in higher education are required to change attitudes and methods of work aimed primarily at improving the quality of the educational process. Firstly, this implies the creation of appropriate working conditions. Favorable working conditions have a key impact on the employees' ability to do their jobs properly and effectively. Secondly, encouraging employees and recognizing their successes and achievements are of importance. Ordinary employees should have the opportunity of career advancement. They need to be confident that their efforts will be appreciated and that the goals they have achieved will lead to even greater success in the organization.

The implications of total quality management in higher educational management are usually performed by a series of small complemen-

[9] E. Psomas, J. Antony, *Total quality management elements and results in higher education institutions: The Greek case*, "Quality Assurance in Education" 2017, no. 25(2), pp. 206-223.

[10] L. Hickman, M. Akdere, *Stakeholder Theory: Implications for Total Quality Management in Higher Education*, [in:] *Fourth International Conference on Lean Six Sigma: Leading the Future of Lean and Six Sigma Research Methodologies*, Purdue University 2017.

tary projects. The philosophy of total quality management is inherently large-scale, inspiring and comprehensive, but its practical implementation is phased, very practical and consistent. The durable and lasting changes are based on a long series of small and achievable projects[11].

Globalization of modern science requires from the institutions of higher education to improve the quality of scientific research, to introduce interdisciplinary approaches to the creation and dissemination of intellectual resources for active participation in the world scientific space. Actualization of the problem of knowledge management culture is caused by the need to mobilize scientific activity, to practically implement scientific results, and improve the quality of higher education.

Continuous technological and demographic changes, the policy of 'open borders', as well as some other reasons are forcing the European higher education system to be flexible and constructive at all three organizational levels of knowledge management: cognitive, managerial and technological ones.

The cognitive level of organizing knowledge management culture provides for the study on the nature of knowledge, the features of knowledge development, the ability to manage knowledge, information culture, etc. The research at this level involves a change in the style of thinking, mobilization of individual intellectual potential, creativity, transformational leadership, etc.

The cognitive level provides for the conceptualization and formalization of knowledge management culture. B.-S. Tan offered the research tools to investigate the relationship between organizational culture and the performance of knowledge management. Researchers use different approaches; however, they obtain the same result: more homogeneous cultures, which encourage teamwork and have a clearly articulated mission, improve organizational performance and, accordingly, knowledge management[12].

Knowledge management models are aimed at conceptualizing and promoting information culture. One of such models is presented in the study of M. S. Reinhardt, et al. The model demonstrates possibilities of promoting a specific information culture and energy culture among students of higher education institutions. The authors propose the use of didactic materials and educational strategies that promote learning and development practice in the context of an efficient and transparent

[11] O. Horban, L. Babenko, L. Lomachinska, O. Hora, R. Martych, *A kknowledge management culture in the European higher education system*, "Naukovyi Visnyk Natsionalnoho Hirnychoho Universytetu" 2021, no. 2, pp. 173-177.

[12] B.-S. Tan, *In search of the link between organizational culture and performance: A review from the conclusion validity perspective*, "Leadership & Organization Development Journal" 2019, vol. 40, no. 3, pp. 356-368.

knowledge transfer process, as well as individual practices in behavior change when using energy[13].

The study on innovation and knowledge exchange in the academic literature is of great importance in organizing knowledge management culture in the higher education system. Knowledge exchange in the academic environment is considered to be one of the most important research topics in the field of knowledge management. Knowledge sharing is a major driver of innovation. An organization that encourages knowledge sharing fosters innovative opportunities.

Castaneda D. I. and Cuellar S. found 7991 publications between 1973 and 2017 which deal with innovation and knowledge sharing. They used the H-index to find the consolidated topics. The consolidated topics in knowledge exchange turned out to be knowledge transfer, knowledge management, and technology transfer. In the case of innovation, they covered the topics of innovation systems, technological innovation, product development and creativity.

Castaneda D. I. and Cuellar S. found that in 2017, the number of published articles on relationships, knowledge sharing and innovations was higher than over the previous years. They concluded that the study on knowledge exchange and innovation moved from a technological approach to knowledge networks at the stage of primary development to knowledge acquisition at the highest stage of development[14]. Castaneda and Cuellar claim that dialogue and collaboration are the main tools for transforming knowledge into innovation. Knowledge is exchanged to foster innovation. This natural focus on dialogue and collaboration explains the collective creation of knowledge and the production of goods and services.

Johanson M., Kao P. T., and Lundberg H. investigated the efficiency of knowledge development and knowledge management as a way of attracting top professionals and internationalizing an organization. The transfer of three types of knowledge was researched: general knowledge of a foreign market, knowledge of social networks, and professional knowledge. The authors considered both the private and professional connections of the visiting researchers. The research shows that characteristics of a localized specialist and organization can influence the type of transferred knowledge and the way it is used. The results of the study reveal the key role of a person as a bearer of knowledge and show an al-

[13] M.S. Reinhardt, B. Ríos, C.P. Tello, F. González Navarro, H. Campbell Ramírez, *A knowledge management approach to promote an energy culture in higher education*, "Knowledge Management Research & Practice" 2020, no. 18(4), pp. 424-438.
[14] D.I. Castaneda, S. Cuellar, *Knowledge sharing and innovation: A systematic review*, "Knowledge and Process Management" 2020, no. 27, pp. 159-173.

ternative way of acquiring knowledge in the context of organization internationalization[15].

The research of M. Johanson, P. T. Kao, and H. Lundberg proves that the internalization of universities is one of the ways to 'instill' advanced knowledge in the organization, thereby improving its organizational and information culture. Private and professional contacts of visiting researchers increase the intellectual potential of universities and improve the local information and organizational culture.

Another way to 'instill' advanced knowledge in universities was studied by R. N. Pagani, et al. Their research proves that one of the ways to access advanced knowledge can be (1) international movement of scientists from developing countries, as well as (2) international student mobility as a way to increase tacit knowledge in the country. R.N. Pagani et al. studied two groups of students, one from Brazil and the other from France, who had been participating in an international student mobility program for more than six months. The results of the study identified the main obstacles and the most effective mechanisms for this category of knowledge and technology transfer. Based on the results R.N. Pagani, et al. developed a model in which two universities are used as an interface – transmitting and receiving[16].

Cegarra-Navarro J.-G. and Martelo-Landroguez S. Draw attention to the problem of intellectual capital, which is created and developed by the institutions of the higher education system, consists not only of knowledge and practice of its application. The creation of knowledge, its development, and transfer is accompanied by rumors, gossip, inappropriate or false beliefs, delusions, etc., i. e., creating counter-knowledge. The research by J.-G. Cegarra-Navarro and S. Martelo-Landroguez prove that organizational memory not only improves the application of acquired knowledge, but also contributes to the reinforcement of counter-knowledge. Moreover, the research shows that developing organizational memory on the pre-existing link between knowledge and counter-knowledge reduces the flexibility of an organization or "organizational flexibility"[17].

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[15] M. Johanson, P.T. Kao, H. Lundberg, *Knowledge grafting during internationalization: utilizing localized professionals in the foreign market*, "Journal of Knowledge Management" 2020, vol. 24, no. 9, pp. 2009-2033.

[16] R.N. Pagani, B. Ramond, V.L. Da Silva, G. Zammar, J.L. Kovaleski, *Key factors in university-to-university knowledge and technology transfer on international student mobility*, "Knowledge Management Research & Practice" 2020, no. 18(4), pp. 405-423.

[17] J.-G. Cegarra-Navarro, S. Martelo-Landroguez, *The effect of organizational memory on organizational agility: Testing the role of counter-knowledge and knowledge application*, "Journal of Intellectual Capital" 2020, vol. 21, no. 3, pp. 459-479.

The more knowledge an organization creates, the more counter-knowledge appears. J.-G. Cegarra-Navarro and S. Martelo-Landroguez emphasize that if the influence of counter-knowledge is not promptly reduced, then its accumulation becomes an obstacle to innovation and creativity. The accumulation and consolidation of counter-knowledge lead to a decrease in the effectiveness of an organization in creating knowledge. Cegarra-Navarro and Martelo-Landroguez point out the need to envisage the ways of counteracting the counter-knowledge in modeling knowledge management.

The managerial level of organizational and information culture in the European higher education system is guided by two megatrends:

1. Information and communication technologies which are continuously becoming more complex.
2. Globalization.

The current competitive environment is forcing the European higher education system to continuously improve knowledge management models, organizational and information culture. The main feature of universities is the fact that they must not only correspond to modern trends, but also be ahead of them. The university, as a specific organizational structure, should promote an advanced knowledge management culture. It should become an example of a new organizational culture, which by its viability, proves the effectiveness of implementing the latest scientific developments in everyday practice.

In our opinion, the experience of leading European universities, which have continuously improved their own organizational and information culture in difficult competitive conditions, is of particular interest for Ukrainian universities. Therefore, a retrospective analysis of the transformational path of a British university towards achieving a new radical mission – to become a 'University of Entrepreneurship' – seems to be an opportunity to rethink the experience of the UK higher education system in order to take the best for its own reform.

Purcell W.M. and Chahine T. identified the main idea at the heart of reforming the UK higher education system. Universities are seen as a community of knowledge workers and professionals in providing services in which leadership and management are collegial and consistent. A collegial organization, which is based on conviction and consensus rather than dictate, has the potential for strategic transformation. The collegial organization of universities activates people and unites them around a common goal[18].

[18] W.M. Purcell, T. Chahine, *Leadership and governance frameworks driving transformational change in an entrepreneurial UK university*, "Leadership & Organization Development Journal", vol. 40, no. 5, pp. 612-623.

Thus, effective reform of the higher education system in the current competitive environment is based on the conscious interaction of leaders with social networks, and is aimed, first of all, at the disclosure and purposeful implementation of the potential of social networks. It is the collegial management model that allows universities to develop and implement advanced organizational and information culture, as well as to carry out global transformations of the organization in an extremely difficult competitive environment.

The research by W.M. Purcell and T. Chahine proves the importance of the connection between the command and control structure of the university and the social networks of the staff and stakeholders. This connection is based on the achievement of a common goal – the prospects for university development. Purcell and Chahine conclude that only the organization based on transformational leadership can thrive in a changeable, complex and ambiguous environment and maintain a competitive advantage in a dynamic global market. Leaders who form the backbone of the university command and control structure should be able to use social forces and inspire people to take actions based on a common vision of the university prospect, including the perspectives of these project participants[19].

The conditions of the pandemic have brought about significant changes in the organization of knowledge management culture in the modern system of higher education. The effectiveness of distance teaching and distance organization of higher education has come to the fore. This raised the need to improve the management models of higher education institutions and to change the functions of the key actors in management models. S. Mysirlaki and F. Paraskeva presented the results of studying the influence of emotional intelligence and transformational leadership on the effectiveness of a virtual team[20]. S. Mysirlaki and F. Paraskeva focused on three factors: team effectiveness, organizational vitality, and team and organizational satisfaction. The authors found a significant predictive relationship between the perceived emotional intelligence of a leader and the factors of virtual team effectiveness.

The research by S. Mysirlaki and F. Paraskeva justifies the increased dependence of the quality of distance education on transformational leadership. The organization of knowledge management culture in the modern higher education system has come to depend on two key factors: opportunities for higher education managers to motivate the

[19] Ibidem.

[20] S. Mysirlaki, F. Paraskeva, *Emotional intelligence and transformational leadership in virtual teams: lessons from MMOGs*, "Leadership & Organization Development Journal" 2020, vol. 41, no. 4, pp. 551-566.

research and teaching staff and opportunities for teachers to motivate students. The research also substantiates a direct relationship between organizational culture and trans- formational leadership.

Communication with production occupies a key place in the organizational culture of modern European education. The main mission of universities is to provide an effective link between knowledge and practice. 'University of entrepreneurship' is a new sense of organizational and information culture on the basis of which the European system of higher education is being reformed.

The relevance and necessity of communication between universities and manufacturing companies is proved by the research of M. van Oostrom, J. A. Pedraza-Rodríguez, and M. Fernández-Esquinas[21]. The authors of the study surveyed 737 companies in the regional innovation system of Andalusia, Spain. The aim of the survey was to prove the importance of the proximity of manufacturing companies to universities and the existence of institutions specializing in the knowledge transfer between universities and companies. The authors concluded that both companies and the engaged institutions located in the Science and Technology Parks are essential in advancing knowledge with local universities. The manufacturing companies, the university and the institutions linking the companies with the university when located in close proximity to each other can ensure the most effective creation of knowledge, its promotion and implementation into production.

An important place in modern studies on the managerial level of organizing knowledge management culture is occupied by the studies on 'knowledge spillovers effects'. G. Barboza and A. Capocchi presented the results of knowledge spillover effects on employment using the database of 245 innovative Italian startups created as a result of adopting the Legislative Decree 179/12 in Italy in 2012[22]. The empirical results support regional specialization as a major force for knowledge creation and transfer, leading to an increased employment rate. The study by Barboza and Capocchi found that there was a lack of technological convergence between the regions since characteristic regional differences were not overlapped by the knowledge spillover effects.

The study by G. Barboza and A. Capocchi demonstrates that regional differences and limited transfer of knowledge between the regions

[21] M. van Oostrom, J.A. Pedraza-Rodríguez, M. Fernández-Esquinas, *Does the Location in a Science and Technology Park Influence University – Industry Relationships?: Evidence From a Peripheral Region*, "International Journal of Knowledge Management (IJKM)" 2019, vol. 15(3), pp. 66-82.

[22] G. Barboza, A. Capocchi, *Innovative startups in Italy. Managerial challenges of knowledge spillovers effects on employment generation*, "Journal of Knowledge Management" 2020, vol. 24, no. 10, pp. 2573-2596.

remain the main obstacles to the flow of knowledge. The study suggests that regional universities face the challenge of developing, transferring and acquiring knowledge. The data support the existing regional heterogeneity in terms of economic and technological specialization as sources of employment.

One way to overcome the knowledge spillover effects faced by regional universities was suggested by M. E. Brown, T. Rizzuto and P. Singh. Their research reveals the peculiarities of strategic compatibility, cooperation and collective influence of the European higher education system on societal changes[23]. The authors highlight the concept of 'strategic compatibility assessment'. They suggest using the strategic compatibility assessment (SCA) to identify the inter-organizational potential for collaboration within and between universities as a means of motivating the synergies that are required for societal change initiatives.

Brown M. E., Rizzuto T., and Singh P. argue that the higher education system best solves complex social problems only when solutions are achieved by the joint efforts of higher education institutions. An inter-university partnership is sustainable and efficient when relations between universities are governed by the command and control structure of the Ministry of Education.

Brown M.E., Rizzuto T., and Singh P. developed an approach to identifying and forming mutually compatible cooperation between the organizations responsible for sustainable development and prosperity of society. The proposed approach allows improving the higher education governance model based on feedback from the changing European society.

The technological level of organization and information culture in the European system of higher education provides for the study on the possibilities of modern information and communication technology in the accumulation, transfer and management of knowledge. Information and communication technologies are seen as a vital part of knowledge management, providing means for creating, sharing and collecting knowledge.

The research on the relationship between knowledge management and information technology has identified four main directions for the near future. These are social software, consumerization (of knowledge), human factors, and organization of work, systems and practices[24].

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[23] M.E. Brown, T. Rizzuto, P. Singh, *Strategic compatibility, collaboration and collective impact for community change*, "Leadership & Organization Development Journal" 2019, vol. 40, no. 4, pp. 421-434.

[24] P. Sarka, P. Heisig, N.H.M. Caldwell, A.M. Maier, C. Ipsen, *Future research on information technology in knowledge management*, "Knowledge and Process Management" 2019, no. 26, pp. 277-296.

Modern realities demonstrate that the efficiency and competitiveness of science and education are ensured not only by human capital, but also by the role of artificial intelligence in the development of human capital.

Vodenko K.V. and Lyausheva S.A. developed the concept of organizing science and education in the form of 4.0. The proposed concept attracts attention by the fact that, on the one hand, in science and education, the intellectual capital is determined by the decisive factor of production. However, on the other hand, human intelligence does not have to dominate the structure of intellectual capital. The concept claims that artificial intelligence is one of the most popular technologies of the 4.0 Industry in the system of science and education and has broad prospects for practical implementation[25].

The research by D. Alassaf, M. Dabić, D. Shifrer and T. Daim draws attention to the fact that an important place in the organization of knowledge management culture in the modern system of higher education is occupied by open innovations and technologies for their transfer[26]. D. Alassaf, et al. conducted a study "Determination of industrial educational needs in the field of open innovation in Europe" through quantitative analysis using a logistic regression model. The authors surveyed 528 employees across 28 different industries in 37 countries mostly in Europe. The obtained results show that the openness of the organizational and information culture increases the feasibility of adopting the 'open innovation' paradigm. It is even of greater importance that the results of the study by D. Alassaf, et al. highlight the positive mediating effects of knowledge and employee rewards on the relationship between open organizations and open innovation.

The study by D. Alassaf, et al. explains the reason why cultures of open borders are more likely to have a successful implementation of open innovations and, accordingly, to be more successful in a competitive space[27].

Noteworthy is the study on a new, intensively developing information space, coworking space (CWS). Coworking space (CWS) is a globally growing phenomenon of a new collaborative work environment

[25] K.V. Vodenko, S.A. Lyausheva, *Science and education in the form 4.0: public policy and organization based on human and artificial intellectual capital*, "Journal of Intellectual Capital" 2020, vol. 21, no. 4, pp. 549-564.
[26] D. Alassaf, M. Dabić, D. Shifrer, T. Daim, *The impact of open-border organization culture and employees' knowledge, attitudes, and rewards with regards to open innovation: an empirical study*, "Journal of Knowledge Management" 2020, vol. 24, no. 9, pp. 2273-2297.
[27] Ibidem.

used by freelancers, entrepreneurs and small businesses that often work in the information technology and creative industries.

The research by A. Rese, C.S. Kopplin and C. Nielebock discovers the meanings of coworking space (CWS). A. Rese, et al. studied the exchange of knowledge among colleagues with a special focus on attitudes, behavior and individual creativity. The research shows that the attitude towards knowledge sharing and the actual sharing behavior in coworking spaces (CWS) improve the creativity of colleagues and the organization as a whole[28].

Thus, the conducted analysis allowed us to conclude the following:

1. In modern research, education is regarded as a behavioral model in which management models play an important role. Taking into account the international experience, it was proved that the implications of total quality management in educational policy would significantly increase the effectiveness of reforming the quality of education.

2. Knowledge management culture in the European higher education system is not limited to the process of knowledge creation, knowledge exchange and knowledge implementation. The European higher education system is faced with the need to solve the problem of the impact of knowledge management culture in individual, group and organization performance.

3. Knowledge management culture is closely related to the organizational culture of the European higher education institutions. The integration processes taking place in the European Union are not likely to overcome regional characteristics. Within the boundaries of the European higher education system, one can observe different dynamics of development and the relationship between organizational and information culture.

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ELECTRONIC PLATFORM FOR ADULT LEARNING IN EUROPE – EPALE. CHALLENGES AND OPPORTUNITIES FOR CURRENT AND FUTURE USERS

On 1 October 2014, the Electronic Platform for Adult Learning in Europe (EPALE) was launched at www.ec.europa.eu/epale, dedicated to specialists in the field of adult education: including trainers, adult teachers, policymakers, scientists and volunteers. EPALE is one of the tools of the European Commission aimed at supporting the development of competences of adult education staff and in the further perspective – contributing to the improvement of the quality of adult learning in Europe. The platform is financed by the Erasmus+ program, the Adult Education sector. It offers adult education staff the opportunity to undertake a different type of cooperation than that carried out within the framework of projects co-financed by the program[1].

EPALE aims to become the premier adult learning website in Europe, offering its target groups unique functionalities. Under the EPALE a pan-European interactive adult learning community will be created. For the community, the platform will be a space to establish industry contacts, to exchange experience, to publish and comment on content, to find inspiration and partners for projects. In addition, users will have access to updated information on the most important events, courses, achievements and trends in the adult education sector, both on a European scale and in respect for individual countries. The pan-European

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[1] M. Łużak, A. Pokrzywnicka, *Nowa inicjatywa Komisji Europejskiej – Elektroniczna platforma na rzecz uczenia się dorosłych w Europie (EPALE)*, „Rocznik Andragogiczny" 2014, no. 21, pp. 559-560.

character of the platform and its wide impact are to be achieved, inter alia, thanks to EPALE's multilingualism, which will allow people from all over Europe to use all the website's functionalities and resources. In practice, this means that important information and resources will be translated into national languages, and users will be able to publish content in any language[2].

Improving competencies of adult educators vs European policies

Europeans see the need to develop, learn and participate in the improvement of competencies and qualifications. A CEDEFOP survey on adult learning and VET in Europe[3] shows that adults greatly support adult learning and appreciate the benefits of it. People participate in adult learning to improve their professional skills and personal development. The respondents clearly indicate the benefits of adult learning, such as career progression, finding a new job, improving incomes and reducing unemployment. Almost 75% of those surveyed pointed out the importance of adult learning for personal development.

Moreover, adults with low literacy skills (including older people, disabled and/ or migrants) are significantly disadvantaged in participating in adult learning. Many of them are not interested in learning because, due to their low level, they experience other obstacles such as time, language, cultural, physical or financial constraints and do not see the purpose or value of education. Regardless of social class or background, access to education is crucial to break inherited social disadvantages. A broader redistributive approach to designing AE initiatives might help to target the lowest skilled[4].

For years, the European Union has also seen a strong need to support and develop adult education and introduced several strategies and recommendations to encourage the Member States to act in this area.

In 2020, the Working Group on Adult Learning established under the Strategic Framework for European Cooperation in Education and Training (ET 2020) published a report[5] analysing progress in imple-

[2] Ibidem, p. 560.

[3] More perceptions: opinion survey on adult learning and continuing vocational education and training in Europe, ENVolume 2: Views of adults in Europe, Publications Office of the European Union, 2021.

[4] PIAAC Thematic Review on Adult Learning, Desjardins, R., OECD Education Working Papers, No. 223, OECD Publishing, Paris, 2020.

[5] Achievements under the Renewed European Agenda for Adult Learning, Report of the ET 2020 Working Group on Adult Learning (2018-2020), Publications Office of the European Union, 2019.

menting the European Agenda for Adult Learning[6]. According to the Agenda, by 2020, 15% of adults should participate in education and training (i.e. persons aged 25-64 participating in education or training in the four weeks before the survey). The European average (27 countries) was 8.1% in 2011, rising to 9.2% by 2020[7]. It means that the target has not been met at the EU level. However, looking at the adult learning rate over 12 months, the situation looks slightly better. In 2016, an average of 45.1% of adult Europeans participated in education or training, and this value has increased by more than ten percentage points compared to 2007[8].

Despite the lack of spectacular results at the level of the indicators, the experts stressed that policymakers have started to pay attention to adult learning. The field of adult learning policy has been significantly broadened, going beyond traditional thinking about education. At the same time, there have been changes and improvements in the governance of the adult learning system in the Member States. The actions targeted at the specific groups have been implemented, especially for those at risk of exclusion; more tailored and digital development services have been developed, and quality assurance mechanisms for education and training have been put in place. At the same time, several initiatives were implemented at the EU level that supported adult learning.

Such initiative is EPALE, which aims to improve the competencies of adult educators in many areas, and thus to raise the quality of adult education across Europe. As indicated in the report Education at a Glance 2021 OECD Indicators[9], teachers are vital to the success of education: "There is compelling evidence that the calibre of teachers is the most significant in-school determinant of student achievement, so concerted efforts are needed to attract top talent to the teaching profession and provide them with high-quality training".

Under the broader policy priorities defined in the Europe 2020, the Education & Training 2020[10], the renewed European Agenda for Adult Learning[11], the Re-thinking Education Strategy[12] and the Opening

[6] Official Journal of the European Union, C 372, 20 December 2011, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:C:2011:372:TOC.

[7] Eurostat, Labour Force Survey, https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=trng_lfse_01&lang=en [18.10.2021].

[8] Eurostat, Adult Education Survey, https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=trng_aes_100&lang=en [18.10.2021].

[9] Education at a Glance 2021 OECD INDICATORS, OECD 2021.

[10] Council conclusions of 12 May 2009 on a strategic framework for European cooperation in education and training "ET 2020", 28.05.2009.

[11] Official Journal of the European Union, C 372, 20 December 2011, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:C:2011:372:TOC.

Up Education Communication[13], EPALE aims to achieve the following objectives:

- Improve the quality of adult learning in Europe through the internationalisation of adult learning and training organisations and the professional development of their staff;
- Hosting communities of practice in the various fields of adult learning and between all stakeholders, such as teachers or policymakers, including the National Coordinators for the implementation of the European Agenda for Adult Learning;
- Facilitate the creation and sharing of (open educational) resources for using in adults' teaching, including the use of new technologies;
- Support strategies and activities to increase adult participation in adult learning;
- Increase knowledge and raise awareness on the importance of adult learning;
- Provide networking opportunities for adult learning stakeholders to develop and carry out joint projects or other activities (e.g. job shadowing, exchange of good practices etc.), including the support of Erasmus + funding[14].

EPALE – Electronic Platform for Adult Learning in Europe

Created in 2015, EPALE is a multilingual open membership community, with over 100.000 European professionals across Europe: teachers, trainers, researchers, academics, volunteers, national policymakers and influential organisations responsible for adult education; NGOs in the field of adult education; schools for adults; adult education providers; folk universities; Third Age Universities; public and private employment services, including labour offices and career counsellors, employers; employees of human resources departments; trainers and educators; culture institutions including libraries, museums, culture centres; continuing VET providers; andragogy faculties; national and regional centres and institutes.

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[12] Communication from the Commission to The European Parliament, The Council, The European Economic an Social Commitee and The Committee of The Regions, Rethinking Education: Investing in skills for better socio-economic outcomes, Strasbourg, 20.11.2012.

[13] Communication from the Commission to The European Parliament, The Council, The European Economic an Social Commitee and The Committee of The Regions, Opening up Education: Innovative teaching and learning for all through new, Brussels, 25.9.2013.

[14] Restrticted Call for Proposals EACEA No 01/2015, EPALE National Support Services (NSS), 2015.

Managed by a Central Support Service and 37 National Support Teams across Europe, EPALE is set up around sharing content related to adult learning, including news, blog posts, resources around specific topics to value ideas and seek partners to build a European project.

The EPALE website has many functions. The main menu features various tabs that allow for versatile use of the platform. The contribute menu is entirely devoted to content. The possibility of co-creation of the platform is probably its most significant advantage – each registered user can publish news, information about events, materials, blog entries or comments on the publications of others.

The collaborate section fosters cooperation, exchange and activity of EPALE users and allows them to co-create the so-called communities of practice. These online groups bring together people with similar interests to share experiences, ideas and good practices. These include groups on broad topics such as validation of learning outcomes, education in prisons, basic skills, and groups for organisations working on a specific project idea or beneficiaries from a particular country. There are Europeans and inhabitants of more distant parts of the world (such as the United Arab Emirates, Israel or Japan)[15].

Another important EPALE tool is Partner Search, which aims to foster mobility and virtual cooperation across Europe, supporting the achievement of the objectives and priorities of the strategic framework for European cooperation in education and training (ET2020)[16], in particular, the priority "Making lifelong learning and mobility a reality for all". The partner search tool supports creating new European projects and the exchange of expertise in adult learning. The instrument is open to individuals and organisations wishing to establish short- or long-term cooperation and form partnerships for specific activities across Europe, such as projects funded under the Erasmus+ programme[17].

The learn section is a centre, offering many opportunities to gather and develop new competencies. Under this menu section, there are MOOCs, OERs (Open Educational Resources), a broad range of educational materials, and easy to adapt and integrate for specific needs.

In my EPALE section, there is access to the personal profile, where the contributions and comments, subscribed groups can be viewed, and the dashboard allows access to all the opportunities on EPALE. Only

[15] https://epale.ec.europa.eu/en/blog/breaking-news-new-epale-has-been-launched [18.10.2021].

[16] Council conclusions of 12 May 2009 on a strategic framework for European cooperation in education and training "ET 2020", 28.05.2009.

[17] https://epale.ec.europa.eu/pl [18.10.2021].

registered users can have access to this function and the chance to see unique content and post and comment on the site[18].

Erasmus+ Space is a secure tool created for Erasmus+ projects. Project coordinators and partners can use it for both collaboration and dissemination as it offers the possibility to upload content and communicate with a broader audience privately. Erasmus+ Space allows to collaborate and manage the project activities[19].

The community of VET practitioners concerns professionals involved in developing adult skills in the labour market. The space acts as an interactive platform for teachers and trainers and helps network and exchange good practices and ideas. It provides access to news about European policies[20].

In 2017 the European Commission, Directorate-General for Employment, Social Affairs and Inclusion (DG EMPL), commissioned a study on the impact of EPALE in its first two years of operation (January 2015 – December 2016) and its potential future implications[21]. The survey aimed to find out whether EPALE, a tool for raising the quality of adult education in Europe, was efficient, responded to the needs of its audience and what impact it had on the adult education environment in Europe. It identified issues for improvement in the further implementation of the EPALE project. The synthesis report showed that the survey was prematurely conducted as the platform had only been operational for two years, and it was impossible to draw complete conclusions. Nevertheless, the study results showed that the launch of the EPALE platform has significantly contributed to creating a virtual space for the exchange of information and best practices and the building of partnerships and cooperation in the sector. However, EPALE's contribution to creating a transnational community of adult educators has so far been somewhat limited. The community is highly fragmented, and the potential of EPALE has not been fully exploited due to several technical problems (slow platform performance, lack of expected features, problems with information retrieval).

However, EPALE has many strengths and great potential as a unique multilingual, transnational and multifunctional online platform offering users an all-in-one solution for discussion, peer-to-peer networking, news sharing, project results, good practices and events. Since

[18] https://epale.ec.europa.eu/en/blog/breaking-news-new-epale-has-been-launched [18.10.2021].
[19] https://epale.ec.europa.eu/pl/erasmus-space [18.10.2021].
[20] https://epale.ec.europa.eu/pl/practitioners-in-vet [18.10.2021].
[21] Study on the impact of EPALE in its first two years of operation (January 2015 – December 2016) and its potential future impact, Publications Office of the European Union, 2018.

the report mentioned above, the platform has undergone significant technical changes, and the technical problems identified in the study have been solved. It has gained speed, a new graphic design and a layout in line with current trends. However, its essential functions, features has remained unchanged and is being implemented increasingly better every year. The EPALE platform is the only such place on the web that enables integration of the community of educators, networking, finding foreign partners for joint projects within the Erasmus+ programme and beyond. The EC's decision to continue the project until at least 2024 is also a vital summary and assessment of the effectiveness of the Commission's EPALE tool.

Poland's experience with the EPALE project

The project is implemented in Poland by the Foundation for the Development of the Education System (Fundacja Rozwoju Systemu Edukacji – FRSE), the Polish Erasmus+ National Agency. Poland answered the first call announced by the Education, Audiovisual and Culture Executive Agency (EACEA)[22] and has participated in the EPALE project since its launch in 2015. The National Support Service in Poland plans to work on its further development, which is envisaged at least until 2024.

The National Support Service in Poland carries out several tasks, including in particular:

- To support the general implementation of EPALE, by working closely with the Central Support Service (CSS);
- To contribute to the European communication activities organised by the EPALE CSS and implement national communication activities concerning the platform;
- To network with adult learning and continuing vocational training stakeholders in their respective countries;
- To promote EPALE and gather resources to feed the common platform;
- To encourage and monitor registration and participation in the activities of the platform by the adult learning stakeholders in their respective countries;
- To contribute to the development of the content proposed on the EPALE platform;
- To contribute to the multilingualism of the EPALE platform.

[22] Restrticted Call for Proposals EACEA No 01/2015, EPALE National Support Services (NSS), 2015.

However, the project's main objective is to contribute to the development of the EPALE platform, focusing on the Polish version of EPALE and to promote EPALE among stakeholders of adult education in Poland for increasing the number of registered and active users of the platform.

Over the last six years, the awareness of the EPALE platform and its benefits has grown significantly among adult education stakeholders (including decision-makers). The most essential and satisfying result of the Polish National Support Service's work is the significant number of registered users, which reached 7996 at the end of June 2021[23]. It is the third-highest score in Europe. It has contributed to a greater diversity of the target groups and, therefore, the varied topics and areas of interest on EPALE.

For years, the Polish language version of EPALE has been the leader in Europe regarding the number of visits to the website. In 2020 there were 202.369 unique visitors, and in the first half of 2021, there has already been 172.461. It is a remarkable result of the extensive promotional activities of the Polish National Support Service, which organises EPALE thematic seminars, webinars, podcasts, live conversations on Facebook and runs an intensive campaign promoting EPALE on the Internet.

The Polish office organises a largescale conference (Adult Education Forum) on adult education every year. In 2021, the sixth edition of the Forum will take place. The Forum has earned a reputation as one of the most important conferences in the field, recognisable and attracting adult education professionals who want to develop their competencies, share their experience and discuss important issues. In addition, the NSS staff takes part in external events of adult learning, giving consultancy and presentations on EPALE. All events contributed to the improvement of the quality of adult education in Poland.

The NSS is supported in the promotion of the platform by 16 subcontracted EPALE ambassadors. The ambassadors represent different areas of adult education and diverse types of organisations active in various fields: an NGO organising education of senior citizens, andragogy faculty, a higher education institution, the NGO training trainers, self-employed coaches/trainers, a VET specialist, an evaluation specialist, a specialist of new technologies in education, the representatives of the libraries, cultural institutions, career guidance and labour market.

Moreover, the NSS maintained contact with representatives of crucial adult education stakeholders: the Ministry of Education and Science, the Academic Society of Andragogy, the Polish Agency for Enterprise

[23] EPALE Key Figures and trend report 2nd quarter of 2021, Central Support Service, 2021.

Development, the Polish Chamber of Training Companies, governmental organisations, umbrella organisations, major organisations/ associations in the field of adult education. The NSS was encouraging those contact persons to promote EPALE in their environments.

EPALE NSS is located at Erasmus+ National Agency, and it greatly facilitated the implementation of EPALE communication strategy and increased its effectiveness. Over the last year, the NSS team has closely cooperated with the Polish NA daily, which enabled the promotion of EPALE at various events organised by the National Agency.

The content is mainly published in Polish. The NSS also provided translations of the actual content into Polish (at least one blog, one news and a newsletter per month, plus landing pages) and verified translations provided by the CSS. Those activities contributed to the development of the national version of EPALE.

In 2019, the EPALE National Support Service conducted an in-depth user survey of the Electronic Platform for Adult Learning in Europe among Polish users. The survey's main objective was to identify the needs of users and potential users of the EPALE platform and learn about the possibilities for its development. The survey showed the strengths and weaknesses of the platform, expectations regarding the form and content of texts, and information.

All respondents declared that they put a solid emphasis on their professional development, and it is vital for them to raise their competence and learn about innovative tools supporting adult learning. All of them unanimously admitted a lack of time for using tools or search effectively. They also indicated that the reliability of information sources and quality of data is critical to them. To raise their competencies, respondents indicated, among others, looking for mentors – taking inspiration from other people working in the field who have more professional experience. Some of the respondents participating in workshops or training get inspired by the exercises and tools and implement them during classes and projects. Thematic channels on Youtube, Instagram, blogs, webinars or podcasts of other educators, websites of educational institutions and centres were also indicated as sources of knowledge and inspiration.

Topics and issues indicated by respondents in the context of raising their competencies and inspiration include training methods and techniques and e-learning tools and methods. They also seek inspiration in the education of seniors, communication with adults, motivating 30+ persons to education, education of persons with intellectual disabilities or organisation of education for adults.

The respondents perceived the EPALE platform as a reliable and valuable source of information on adult education. Many respondents in

the qualitative survey also perceive EPALE as a networking tool, particularly for finding partners for projects. Respondents are keen to learn from the experiences of other EPALE users, to connect with experienced mentors who can help them to find a good, proven route to more effective teaching. The possibility of integrating environments supporting adult learning like practitioners, representatives of cultural institutions, project implementers is a substantial potential that can build a better platform position.

The EPALE platform is recognised among adult educators in Poland. Moreover, it has a reputation of a valuable and reliable source of information and knowledge in adult education. It has become a brand. It is the only such website in Poland, freely accessible, rich in content and bringing together many professionals. The creation and development of the EPALE platform in Poland have certainly contributed to the integration of the adult educator community. The presented content attracts commercial educators, adult educators from state adult schools, researchers and andragogists from many Polish universities, senior educators or libraries and cultural institutions, i.e. people from very different areas of this broad field. Thanks to this, a community of mutual learning is being created in Poland and Europe ensuring a better quality of adult education.

Prospects for cooperation with Ukraine within the EPALE project

Ukraine faces the same challenges in adult education as Poland and other European Union countries. With a shrinking workforce and a declining population of young people, upskilling and retraining the Ukrainian working-age population is becoming increasingly important. However, the participation rate in lifelong learning is meagre at 0.8% in 2018 and 0.9% in 2019. It is similar to Romania, the EU country with the lowest adult participation in lifelong learning (0.9% in 2018)[24].

In the first half of 2020, the Ukrainian government paid particular attention to promoting a positive image of VET. A priority challenge is increasing of the number of people undertaking VET development and aligning the education system with labour market needs. Continuing vocational training (CVT) in adult learning within the formal education and training system also needs improvement and regulation[25].

[24] Ukraine. Education, Training and Employment Developments 2020, European Training Foundation, 2020.
[25] Ibidem.

A meaningful change took place in September 2017 when the Law on Education was approved, and it introduced the reform of the New Ukrainian School and shifted the focus from the acquisition and accumulation of knowledge to skills and competencies. A working group was also established in 2018 to draft a law on vocational education[26].

The planned legal reforms and approach to the challenges that Ukraine faces in adult education go hand in hand with the activities of various Ukrainian organisations and their involvement in European and global initiatives.

Ukrainian Coordinating Unit "Adult Education of Ukraine" works under the support of UNESCO Institute of Lifelong Learning and every year since 2000 brings together public and private organisations to help low-income adults, especially third age people in learning and self-improvement. Among other things, it has developed recommendations for the development of adult education in Ukraine[27].

In Ukraine, there is a Public Union "Ukrainian Adult Education Association" aimed at establishing and developing adult education in Ukraine and forming lifelong learning society education[28]. The Ukrainian Adult Education Association has been a member of the European Association for the Education of Adults since 2016, an association actively contributing to the EPALE platform by conducting webinars for platform users, numerous publications and participation in EPALE conferences.

There is no EPALE National Support Service in Ukraine, and the EPALE platform does not have a Ukrainian version. Nevertheless, there are examples of Ukrainian institutions and organisations engaging with the English language version of EPALE, as the platform is open to all adult educators. Organisations such as The Institute of Information Technologies and Learning Tools of NAES of Ukraine (IITLT) or Interregional Academy of Personnel Management (Ukraine), among others, have used the partner search engine on EPALE to publish announcements about partner search[29].

Users of the EPALE platform publish blog articles in various languages on ongoing Polish-Ukrainian partnership projects, including:

[26] Country Strategy Paper 2020 Update, European Training Foundation, 2020.
[27] Adult Education in Ukraine: problems and perspectives, Olena Terenko, 2019.
[28] Ukrainian Adult Education Association, http://www.uaod.org.ua/en/about-us/ [18.10.2021].
[29] Electronic Platform for Adult Learning in Europe, https://epale.ec.europa.eu/pl/organisations [18.10.2021].

- From beneficiaries to change-makers: creative need assessment for empowering local communities[30];
- Maahanmuuttajien perustaidot arjen, työelämän ja tutkinto-vaatimusten risteyksessä[31];
- Projekt Muzeum Warszawy „Warszawa dla średnio zaawansowanych", czyli edukacja muzealna w służbie nauczaniu języków obcych i wymiany doświadczeń kulturowych[32].

Representatives of the EPALE Polish Support Service presented the EPALE project at several international conferences with the participation of representatives of Ukrainian adult education organisations, e.g. representatives of the Precarpathian National University at the Spaces of Adult Learning – SAL2020 conference organised by the University of Warsaw or during the Third Age Forum in Krynica in 2015 and the International Meeting of Friends organised with the participation of leaders of Polish and Ukrainian Universities of the Third Age and the Polish Language and Culture Society in Zaporizhia.

The EPALE platform is co-funded by the Erasmus+ programme and managed by the European Education and Culture Executive Agency (EACEA). So, it is also significant that The National Erasmus+ Office in Ukraine (NEO) was established, The Office which assists the European Commission, the European Education and Culture Executive Agency, the national authorities and higher education institutions in implementing the Erasmus+ programme. The NEO – Ukraine closely follows the policy developments in Ukraine, particularly in higher education and other levels of education[33].

It is worth mentioning that apart from the EU Member States, the EPALE project has also involved EU candidate countries such as Albania, Montenegro, Northern Macedonia, Serbia or Turkey, and such countries as Bosnia and Herzegovina or Iceland which are not yet candidates for membership. As a result, National EPALE Offices actively work

[30] From beneficiaries to change-makers: creative need assessment for empowering local communities, Anna Krawczyk, https://epale.ec.europa.eu/pl/node/304512 [16.07.2021].

[31] Maahanmuuttajien perustaidot arjen, työelämän ja tutkintovaatimusten risteyksessä, https://epale.ec.europa.eu/fi/blog/maahanmuuttajien-perustaidot-arjen-tyoelaman-ja-tutkintovaatimusten-risteyksessa, Maarit Mäkinen [16.07.2021].

[32] Projekt Muzeum Warszawy „Warszawa dla średnio zaawansowanych", czyli edukacja muzealna w służbie nauczaniu języków obcych i wymiany doświadczeń kulturowych, Katarzyna Zak-Caplot, https://epale.ec.europa.eu/pl/blog/projekt-muzeum-warszawy-warszawa-dla-srednio-zaawansowanych-czyli-edukacja-muzealna-w-sluzbie [17.09.2021].

[33] The National Erasmus+ Office – Ukraine, https://erasmusplus.org.ua/en/about-us.html [18.10.2021].

in 37 countries, while EPALE is available to adult educators in the official languages of the EU Member States and Turkish, for example.

Conclusion

In the documents of the European Commission and the Council of the European Union in the years 2000–2002, the principles constituting the basis for the creation of the European area of lifelong learning (LLL) were developed[34]. That is why many European Union programs contain references and incentives for learning at all ages. Particular attention in EU projects should be paid to the so-called non-professional adult education (now supported in the second financial perspective by the Erasmus+ program for 2021-2027, previously under the Erasmus + program for 2014-2020 and as the Grundtvig program in "Lifelong Learning" 2007-2013 and in Socrates 2000-2006).

This sector supports the development of adults in the field of non-professionalism and prioritizes adults in more difficult situations who require special educational support. In practice, the co-financed projects mainly concern the development of key competencies of adults, including the so-called basic skills needed by every adult person for a dignified independent life.

However, the subject of raising and improving the professional competences of adults is covered by another sector of the Erasmus+ program, i.e. education and professional training. In addition, the Erasmus+ program is developing an extremely rich in content and communication opportunities platform for adult education staff EPALE (Electronic Platform for Adult Learning in Europe). Both the implemented projects and the platform contribute to the development of the offer, improvement of the quality of adult education and the competencies of educational staff working with adults as well as adult learners from target groups.

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[34] I. Iskierka, *Edukacja Dorosłych w Programie Erasmus+*, „Dydaktyka Informatyki" 2015, no. 10, pp. 45-46.

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Serhii TEREPYSHCHYI*

MEDIA LITERACY IN THE MODERN EDUCATIONAL PARADIGM

In today's world, digital technologies and media play a central role in learning, well-being, daily life and participation in society. If the 20th century was characterized by the struggle for freedom of speech and access to information, the 21st century has been a period of information abuse. Therefore, every inhabitant of the planet is a carrier and disseminator of information. In connection with the expansion of various approaches and methods of increasing media literacy among the population, today on the agenda is the environmental approach to media literacy, which requires understanding of the place of man in the communication chain, where information is a resource for the individual and man himself is part of global communication.

The aim of the study is to investigate the methods, forms of work and international and domestic practices of media literacy in the adult population.

Today, media literacy is reduced to media competence, which should be formed gradually and in parallel in each individual. Speaking about the fact that media literacy is relevant today for the adult population, even experts emphasize that information nowadays surrounds and accompanies everyone, everywhere and always. A person cannot learn media literacy on his own as, for example, he cannot learn to drive a car on his own. If we consider the media resources that are in every home, in every family, it becomes obvious that the formation of media literacy is as paramount a need as the skills of eating, personal hygiene etc[1].

The problem of media education of a person for life in the information society is in the center of attention of the international community, and above all, such international organizations as UNESCO. This organization promotes media literacy, which is seen as a prerequisite for building inclusive, open, democratic and pluralistic knowledge.

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[1] D. Svyrydenko, S. Terepyshchyi, *Media Literacy and Social Responsibility of Educators in the Conditions of Information War: The Problem Statement*, "Studia Warmińskie" 2020, no. 57, pp. 75-83.

UNESCO has identified five laws (principles) of media literacy[2].

Principle 1. Information, communication, libraries, media, technology, the Internet should be used by society critically. They are equal in status, and none of these sources should be considered as more significant than others.

Here I would like to draw attention to two key words: 'critical' and 'equal in status'. The first principle says how important it is for consumers of information, as well as its creators, to be critical of the information they receive. Since a person set up for analysis and evaluation will look for the most truthful, most neutral information for information awareness. Equalization of all media by status is necessary to avoid the dominance of a particular media or source of information and encourages the search for alternative sources of information.

Principle 2. Every citizen is a creator of information / knowledge. Everyone has the right of access to information / knowledge and the right to self-expression. Media and information literacy are closely linked to human rights and should be for all, both men and women.

Thanks to the spread of Internet and modern media, any resident has the opportunity to become an author / co-author and a disseminator of information. Implementation of this activity contributes to the development of methods for ensuring equal access for all to information tools. Governments are working on this and include in their legislation various rules governing legal relations in the field of information exchange, the right to receive and disseminate information, duties and responsibilities for the publication of individuals. Moreover, compliance with the principle of gender equality is a mandatory requirement.

Principle 3. Information, knowledge and communication are not always neutral, independent or impartial. Any conceptualization, use and application of media literacy must make this statement transparent and understandable to all citizens.

As soon as we begin to select and sort the facts, we begin to influence the information and its filtering. This is not necessarily due to manipulation, but rather in order to make accents, we select the primary and secondary. However, this is a step towards showing the world from our point of view. This principle only emphasizes that such a situation exists, and in working with different sources, and in general, in the process of working with the media, this fact must be taken into account.

Principle 4. Every citizen wants to receive and understand new information, knowledge, messages and be able to communicate

[2] *UNESCO five laws (principles) of media literacy*, 2020, http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/Events/mil_five_laws_english.png [10.10.2021].

with others, even if he does not express the desire. His rights to this must never be violated.

This principle is also enshrined in the legislation of almost all countries by constitutional law. However, due to the development of information and communication technologies, this right has also become related to technology. Technological capabilities have changed the methods of communication. In this regard it is important that this constitutional right is not violated even in the digital transition to modern information exchange.

Principle 5. Media literacy is not acquired at one time. It is a constant and dynamic experience and process. It can be considered in complete if it includes media competence in the use, creation and transmission of media information.

Through interaction with media, modern man is constantly involved in sharing information and is joining a new online culture. At this stage, we are even talking about a specific digital etiquette. The digital environment requires the user to be able to play and engage in various simulations, making him a member of various online communities. The ability to navigate information becomes a necessary skill.

Distortion of the media space due to such phenomena as propaganda, fake information, pranking, digital aggression, trolling, etc. in the media environment today is turning into a crisis. 'Information overload' creates information uncertainty. Manipulation of consciousness through these tools leads to the fact that the world 'swallows' any information provided to the audience without its 'critical autonomy'.

In the Grunwald Declaration on Media Education, adopted at the 1982 UNESCO International Symposium, representatives of the 19 participating countries noted: "Instead of condemning or endorsing the undoubted power of the media, we must recognize their significant influence and penetration into all spheres of life as an established fact, as well as to take into account their importance as an integral element of modern culture. We should not underestimate the role of communication and mass media in the development process, not their function as a tool for active participation of citizens in society. Political and educational systems need to recognize that it is their duty to promote a critical understanding of the phenomenon of communication by citizens (...) if the arguments for media education as a tool for preparing conscious citizenship now cause some uncertainty, then in the very near future, after the

breakthrough in the development of communication technologies, these arguments will become indisputable"[3].

With the development and necessity of the concepts of media literacy, the media educational function of the mass media began to develop actively. It includes the increasing of media competence of the mass audience, developing its ability to perceive the information contained in the media adequately, to analyze it and to create their own socially significant media texts that meet the norms and principles of information culture.

In the process of media education, an intellectual resource is first laid down in a person, is actualized as a result of passing the levels of media literacy, media literacy culture and reaches the level of media literacy worldview.

The pace of development of media literacy of the individual and society does not always coincide, resulting in disharmony of the individual and society. An individual far ahead of society in its understanding of global information processes is doomed to misunderstanding and loneliness, just as society is not able to fully realize its potential if a significant part of citizens do not keep up with the development of information and communication technologies. The most harmonious should be considered mutually enriching growth of media literate potential of the individual and society.

It is obvious that people who have the appropriate competencies in terms of finding and analyzing data and information as well as creating stories from this data and information will be able to perform their abilities. Authors of media messages and media texts who are able to analyze and explain what social events mean and what readers can do to prepare for what will happen next will be able to competently convey competent, accessible information to the audience.

The younger generation perceives information as a reflection, not a representation of reality, processes or events. Sometimes it is even accepted as the only truth. Only critical thinking and the skill of extracting meanings help to get to the bottom of it, to accept information as a symbolic-digital, audio-, video-, printed representation of the world around us.

"I see a media literacy as a vital literacy, because if I can not understand and effectively use the current form of communication, I can not

[3] *Grunwald Declaration on Media Education*, 1982, http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/theme_media_literacy_grunwald_declaration.pdf [10.10.2021].

be effective person in civil, personal or professional level"[4]. N. Anderson is one of the innovators in the field of media education, has made an enormous contribution to the development of media and information literacy, helping teachers integrate technology and competence of media literacy in their curriculum, he held numerous educational lectures and seminars in Asia, Europe, Australia, Canada and the USA.

Media literacy and critical thinking in relation to media content are crucial for health and well-being of younger generation, as well as for their future participation in civic and economic life of the country.

J. Siani realized the danger of overuse and introduced the concept of 'digital power'. His studies show a deeper understanding of our interaction with social networks and their impact, allowing for more attentive use and looking for alive interpersonal communication[5].

Media literacy training often uses a query-based pedagogical model that encourages people to ask questions about what they are watching, hearing and reading. Media literacy training provides tools that help people to analyze messages critically, to offer educators opportunities of expanding their media communication experience, and to help them in developing creative skills in creating their own messages. Critical analysis may include author's identification, the goals and perspectives, a study of construction methods and genres, a study of media presentation models as well as detection of propaganda, censorship and bias in news and public relations programs. Media literacy training can explore how structural features, such as media ownership or its funding model, affect the information presented.

As defined in the Basic Principles of Media Literacy Training: "The purpose of media literacy training comes from the intention to help people of all ages in developing the research habits and expression of skills they need for critical thinking and effective communication"[6].

Below are some, in our opinion, necessary skills for a person in the era of the 4th Information Revolution.

- Media analysis of messages, as a rule, reflect the values and ideology of their producers and distributors. Based on the content of the analysis, it is possible to trace the causes, goals, sources of information and situations.
- Media reading – understanding and comprehension of media content.

[4] N. Anderson, *Voices of Media Literacy project*, March 4, 2011, http://www.medialit.org [09.09.2021].
[5] J. Siani, *Selling your soul: no app for life*, New York 2013, p. 68.
[6] *Basic Principles of Media Literacy Training*, 2020, https://mediaeducationlab.com/sites/default/files/AMLA-Core-Princ-MLE_0.pdf [10.09.2021].

• Analysis of media manipulation – the study of cases, the study of tools for using media for manipulation.

• Creating historical connections – what can we draw from the past and how does it shape today's values, actions, course of events?

• The mass media forecast is a reflection of reality, but also markers, a guide, a direction to the future. The consumer of media messages must be aware of where the news flow of information leads.

• Data analysis – generally accepted comprehensive skills of working with a large amount of information and identifying useful, trendy information, the search for unusual patterns, new hypotheses.

• Skills of possession and the use of technical tools – associated with the search, processing, analysis, summarization, visualization of information. Use of online resources, platforms for deriving reliable facts, searching for the truth, visualization of causal events with the help of online tools.

• Fact-checking – reveals discrepancies between the facts that are published and those that exist in reality.

• Click and information management is the development of skills to assess the potential impact of information on the audience after viewing, listening or reading content.

Media literacy is often referred to as education for life in the global media world. Educational resources of media literacy are a kind of information hubs with an up-to-date expert base of multimedia content. The following online resources are provided for self-study of media literacy. Among them are platforms that facilitate networking between professionals.

Table 1. Online resources for self-study of media literacy

Global Partnership for Media Information Literacy Partnership (GAPMIL)
The UNESCO MIL Alliance, formerly known as the Global Alliance for Media Partnership and Information Literacy (GAPMIL), is an innovative effort to develop international cooperation to ensure that all citizens have access to the media and information competences. This innovative initiative was put forward during the Global Forum on Media and Information Literacy Partnership, which took place from 26 to 28 June, 2013 in Abuja.
MILID Network is the first international university network for media and information literacy and intercultural dialogue and a research unit of GAPMIL. Actively conducts work in three areas: research, education, participation in the development of media literacy.
MIL CLICKS is an innovative strategy in social networks.

It is implemented through the use of social networks: 1) to attract the largest number of people in increasing their media and information literacy 2) to draw public attention to the importance of media and information literacy.
Annual Global Media and Information Literacy Week
The Media Literacy Center for researches and journalists, educators in the media industry with tools for critical analysis, use and creation of quality media content. It serves as a center for research, advocacy, education and professional development on media and information literacy at the local, national and international levels.
The National Media Literacy Association is a national member organization that promotes media literacy in the United States.
One of the first in its field, the Media Literacy Center (CML), is designed to promote and support media literacy training as a basis for accessing information, analyzing, evaluating, creating and participating in media content. CML helps citizens, especially young people, to develop the skills of critical thinking and production of media content necessary for a full life in the 21st century.

Source: compiled by the author.

In addition to foreign projects and various resources, Ukraine has also successfully implemented policy of developing media literacy of the country's population. We can observe slow trend of positive changes in the media education process in our country. The vast majority of effective projects have been initiated and implemented by NGOs and activists, media experts and media educators with the assistance of foreign partners and donors (Academy of Ukrainian Press, RE IX, StopF Media Detector, "Internews Ukraine" and others). The organizations work with educational institutions and therefore there are almost no programs aimed at improving the level of media literacy in the adult population.

Over the past six months, many steps have been taken in this direction in public policy. In particular, on March 22, 2021, as part of the European Media Literacy Week, which was joined by Ukraine, a number of interesting and relevant events were launched to help in implementing the policy of the Ministry of Culture and Information Policy to improve the media literacy index of Ukrainian citizens.

March 29, 2021 – NGO "Media Detector" published the results of a comprehensive study "Index of media literacy Ukrainian audience". Researchers interviewed 2000 respondents face-to-face with a tablet standardized questionnaire (CAPI). The fieldwork performed LLC

"Infosapiyens" and "Smart service date" of December 23, 2020 to January 10, 2021. They got the following results:

- The media literacy index was evaluated on a scale from 0 to 10, where 1 is the lowest level, 10 is the highest, and 5 is the average. According to this scale, media literacy of 15% of Ukrainians is low, 33% – below average, 44% – higher than average level, and 8% – high level of media literacy.
- The level of media literacy depends on gender, age and level of education. The share of men with a high level of media literacy is twice as high as among women (11% vs 6%). The high level of media literacy among young people aged 18-25 (due to digital competence) and low among the older age group 56-65 is quite predictable.
- The lower the educational status, the lower the level of media literacy. Thus, among respondents with general secondary education, the share of people with low and below average rates is 63%, and among those with full / incomplete higher education – only 30%.
- There is a relationship between the type of settlement and the level of media literacy: the lowest level among villagers, the highest – in cities with a population of over 500 thousand.
- Regarding regional differences, the highest level of media literacy is in the northern region, and the lowest – in the south. The share of people with below average and low rates is 41% and 58% respectively.
- The biggest differences in the level of media literacy between people with different financial status. Obviously, the higher the level of well-being, the higher the media literacy. Among the categories that have enough money only for basic needs, 72% have low or below average level. Meanwhile, among the respondents who have enough for everything and who save money, this share is only 33%[7].

April 20, 2021 the Ministry of Culture and Information Policy presented nationwide project of media literacy. This means that for the first time at the national level the topic of media literacy became in the scope of the public policy. The aim of the project for years 2021-2022 is "to raise awareness among all age groups in society concerning the relevance of misinformation and manipulation and the importance of its detection"[8]. The main objectives include: to strengthen communication with the government, to develop the direction of media and to encourage safe media sphere. To achieve these goals, the Ministry of Culture and Information Policy has planned a number of tasks and activities. In par-

[7] *Media Detector*, 2021, https://detector.media/doc/images/news/archive/2021/186435/UA_REPORT_MEDIALITERA%D0%A1Y_INDEX-DM.pdf [12.10.2021].

[8] Ministry of Culture and Information Policy, 2021, https://mkip.gov.ua/en [12.10.2021].

ticular, in terms of strengthening communication on media literacy initiatives – it has been proposed to create a media literacy brand and to develop messages and narratives; to launch a national media literacy platform and a nationwide information campaign for vulnerable groups involving national media, opinion leaders and bloggers; constantly interact with public organizations and partners.

Promoting a responsible and safe media environment involves active cooperation with journalists and workshops for journalists, the creation of a TV project in the genre of social realities, joint information campaigns with national media to raise public awareness of the challenges of misinformation and manipulation. A number of these measures will be developed in co-operation with the OSCE. Another promising direction in the development of media literacy will include cooperation with the United Kingdom and IREX.

Conclusions

Thus, the media literacy is a system of basic human competencies that allow for building communication relations in the post-information society effectively and satisfing the need for media activity. Media literacy arises as a result of media education. Accordingly, media education is a set of multidirectional educational activities that contribute to the disclosure and self-organization of the individual in the information society, which are manifested in conscious media behavior based on humanistic ideals and values. In Ukraine, despite the public demand, public policy is largely focused on the introduction of media education in general secondary education and higher education. At the same time, other target audiences are poorly covered by the relevant training programs.

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CHAPTER II

EDUCATION AND SOCIAL COHESION DEVELOPMENT

Marina DIELINI*

SOCIAL RESPONSIBILITY AS A VALUE OF THE EUROPEAN UNION AND ITS DISSEMINATION IN UKRAINE

The development of the European Union is impossible without its fundamental values, namely: human dignity, democracy, equity, rule of law and human rights. However, other values, such as sustainable development, inclusion, tolerance, responsibility, etc., have recently become widespread. These values should be disseminated among Ukrainians as we are paving the way for full membership in the EU.

This study is focused on the value of responsibility, which is widely disclosed and represented in the European Union. Responsibility could be treated as a person's vision of his own contribution to a particular situation and a particular result; when the individual does not shift responsibility for himself and his life to others. Responsibility itself has become the basis for social responsibility, legal responsibility and other types of responsibility that have developed on this basis.

To achieve the purpose of the research we will turn to the origin of this concept. Thus, social responsibility has its origins in the development of philosophical science, namely the term 'responsibility', which has been considered by different scholars from different points of view. To achieve this task, we form a table presenting the views of philosophers on this category in chronological order (see: Table 1).

Table 1. Views of scientists on responsibility

Scientist	Historical period	Main idea
Plato	IV st. B.C.	The clearly formed question is to what extent a person is consciously and voluntarily the creator of his actions and to what extent he or she is responsible for them. Plato recognized for man the possibility of free choice and thus responsibility for their actions. In addition,

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		he saw the roots of responsibility, which lie in the relationship between people, which is imposed on a particular person in the form of duties.
Aristotle	IV st. B.C.	In Nicomachean Ethics, he described ethics and politics as the science of the free choice that a person responsible for his actions makes. He connects the concept of responsibility with freedom of will and freedom of choice. He rightly raises the question of the possibility and appropriateness of a person's responsibility for actions he commits due to ignorance of certain rules and norms.
Democritus	V-IV centuries. B.C.	A person must evaluate his actions not only from the point of view of others, but also from the standpoint of his own moral attitude to them.
T. Hobbes	XVII century	He connects the fact of the emergence of the category of responsibility with the emergence of the state, society as a whole. He argues that public (social) responsibility arises as a result of the transfer of people's rights to public power. The responsibility of the individual arises as a result of the powers of public authority.
J. Locke	XVII century	In his views on responsibility, the starting point is the natural state of society. This is a state of freedom, not a state of chaos. Although a person has an uncontrolled freedom, he can do anything with himself and his own property, but he does not have the freedom to destroy himself or any other creature. A person's freedom is restricted by a natural law (i.e., responsibility), which states that no one has the right to restrict another in his life, health, liberty, or property.
P. Holbach	XVIII century	For the first time he expressed the opinion about the responsibility of society to man, because society itself can shape certain human traits (i.e. create bad people).
I. Kant	XVIII century	He considered responsibility from the standpoint of 'pure reason'. Thus, the true instance of responsibility is not the state, but the basis of absolute moral law. This absolute moral law is embodied in the human conscience. Kant's conscience is a subjective principle of responsibility, and its objective side is a categorical imperative – a system of social values as an objective absolute moral law.
K. Marx	XIX century	Responsibility is considered to be a historically determined phenomenon, taking into account the class-

		specific historical approach of human activity in natural connection with the needs of society.
E. Fromm	XX century	Responsibility as a harmony between opposite human features. He points out that responsibility is a person's ability to reach a certain consensus between the freedom he or she desires as an individual and the responsibilities he or she accepts as a member of society.
Y.S. Osokina	XX century	The ability of the individual to subordinate their own interests to the requirements of social development; a form of communication and interaction between society and the individual, which expresses certain relationships between them; selection of the optimal opportunity from their diversity, which involves activities in accordance with it; harmonious combination of the objective need to meet social requirements and awareness of universal values as a unity of rational and emotional; a way of regulating human behavior in which the subject's activities are accompanied by moral self-esteem and a willingness to report on their actions.
A.A. Kravchenko	XX century	Social responsibility is a regulator of people's behavior. On the one hand, it is the reaction of society to the behavior of the individual, on the other – the reaction of the individual to the demands of society. To be responsible is, first of all, to recognize and protect the values of one's environment and to promote the realization of its goals. Thus, the conversation about responsibility can take place only in the context of intersubjective interaction of "I" with "Other". A person is responsible not only to other people, but also to himself.

Source: M. Dielini, *Evolution of business ethics: from general philosophical principles to corporate social responsibility*, "Skhid" 2020, no. 5(169), https://www.researchgate.net/publication/345343654_evolution_of_business_ethics_from_general_philosophical_principles_to_corporate_social_responsibility [20.10.2021].

Thus, we can state that philosophers in general treat responsibility in the context of human responsibility for his actions towards himself and society. Considering the freedom of choice, a person is responsible for his own behavior. But in world each person lives in community with others, that is, he/she is a social being and acts in a certain socio-cultural aspect. This imposes certain obligations on him and limits his actions. In addition, there is not only a responsibility of person towards society, but

also society towards the person. Within this context, we should also mention social responsibility of busines or corporate social responsibility, which can be defined as responsibility of employers towads employees, consumers and society in terms of activity and goods they produced. Considering abovementioned views, corporate responsibility begins with the moral values of business leaders. Responsibility appears in responsible actions for the environment, awareness of individual responsibility for actions within a certain community, as well as towards the staff, etc. Thus, corporate social responsibility focuses on society and individuals as well. In modern society, corporate social responsibility (CSR) plays an important role as a chain that connects social norms and business. This question becomes the object of study of various sciences, i.e. economics, philosophy, sociology, law.

One of the main followers and founder of corporate social responsibility is A. Carroll, who pointed out: "Corporate social responsibility covers economic, legal, ethical and discretionary (charitable) expectations of society from organizations at the moment". Currently, CSR is gaining significant development and acquiring new forms of manifestation, more and more companies are turning to it as a means to improve their image and increase a market share. CSR has positive consequences not only for the company's stakeholders, but also for the company itself, its profits and maintaining a competitive position.

Areas of its manifestation are large in scope and in general can be determined through groups of stakeholders, namely:

- social responsibility to employees of enterprises;
- social responsibility to owners / investors;
- social responsibility to consumers;
- social responsibility to suppliers / competitors;
- social responsibility to the state / community.

The main essence of CSR is that enterprises achieving their main function – making a profit, focused on ethical, environmental manifestations. That is, companies maximize their capital by taking into account the needs of employees, consumers and society. The peculiarity of CSR in the modern world is the fact that more and more companies have turned to the implementation of socially responsible practices, formed departments of social responsibility, developed a report on CSR etc.

The main question is: "Why should an individual or an entrepreneur be socially responsible?" coming from the other: "Was a socially responsible company started with a responsible person?" or "What is important in terms of corporate social responsibility?

In our opinion, the answer to this question depends on the level of development of the country and society. Countries that are just develop-

ing are less socially responsible, so we can say that the moral characteristics of their entrepreneurs are lower than in developed countries. They behave in accordance to their interests – to increase profits. In industrialized or developed countries, entrepreneurs have already associated their interests with ethics and are more socially responsible, they run their business from the social responsible point of view. It is difficult to highlight what lies in the base and what is the most important thing – ethics, which has become the basis for the development of social responsibility or an understanding of the need to take responsibility, because it is a modern trend that positively influences attitudes towards society. But the result is observable on social reports of companies from developed countries.

Based on this, two factors of socially responsible economic activity can be distinguished:

1. Moral qualities of managers, their vision of responsibility as norms of behavior;

2. Understanding the need of this process by taking into account the needs of society.

Such demands of society constitute a manifestation of morality, which supposes that the two factors are interrelated. The development of the second factor can lead to the development of the first one: if it is a moral obligation, then a social responsibility becomes a norm. If the company requires it and the entrepreneur acts accordingly, over time it becomes what is perceived as the norm of behavior of each company. In this case, CSR becomes a rule of behavior, morality, a common practice for every entrepreneur. In this case, we get the influence on the formation of standards conducting at the request of the company, the requirements of the law (compliance with laws, codes). Although CSR is voluntary, the first country in which CSR has become mandatory is India. It has committed charitable companies to companies that have achieved a certain profit. This means that it is beginning to affect not only voluntariness but also the need to implement CSR[1].

Considering global models of social responsibility in different countries, we would like to pay attention to the EU. First, we will present the models of corporate social responsibility existing in the world and reflect the main trends in the formation of the system of corporate social responsibility in companies in different countries. As a rule, there are American, British, European (continental), Japanese and Russian (post-Soviet) models of corporate social responsibility. The characteristics and main features of these models are presented in table 2.

[1] See: M. Dielini, *Evolution of business ethics…*, op. cit.

Table 2. Characteristics of global models of CSR

Model	Characteristics
American model "Open" model of CSR	The main characteristic of this model is voluntary initiatives in the field of CSR, funding of various projects and programs, charity, patronage, sponsorship. The state encourages companies that actively implement CSR programs – they are exempt from a number of taxes, which is enshrined in law. The role of the state within this model is to adopt the necessary package of laws and regulations, recommendations and requirements. At the same time, the functioning of this model is impossible without the state encouragement of social investment in priority areas for society through a system of tax benefits or preferential interest rates.
European model "Hidden" model of CSR	A characteristic feature of the European model is its state regulation, as a result of which it is recognized as a hidden form of CSR. It involves the active participation of the state in the regulation of social and labor relations both at the macro level and at the meso and micro levels.
British model "Mixed" model of CSR	It is essentially a symbiosis of European and American models. As in the European model, the state actively supports business, with the American model similarity is the great activity of corporations in implementing their own social projects. It presupposes the involvement of state and public institutions in the process of harmonization of public interests, provided that corporations and trade unions retain autonomy, ie. the principle of voluntariness is fully respected.
Japanese model	The feature of this model is the system of "lifelong employment" and the relevant conditions of personnel management.
Post-Soviet model	It was formed on the basis of the legacy of socialist enterprises. In the economic system of the Soviet Union, social responsibility of enterprises was not considered as a special type of activity, CSR was a state-established form of activity of the manufacturing sector.

Source: compiled by the author on the base of: N.M. Hradyuk, *Suchasni modeli sotsial'noyi vidpovidal'nosti pidpryyemstv*, Materialy VII Mezinarodni vedecko-prakticka konference: *Nastoleni moderni vedy*, „Ekonomicke vedy" 2011, no. 3, pp. 24-26; Y.I. Mozhovyy, *Modeli korporatyvnoyi sotsial'noyi vidpovidal'nosti v bankakh*, „Efektyvna ekonomika: elektronne naukove fakhove vydannya" 2011, no. 9, http://www.economy.nayka.com.ua/index.php?operation=1&iid=700/ [10.10.2021].

Among the main differences between these models: the level of influence and regulation of the state on CSR, as well as the own initiatives of entrepreneurs to spread CSR to employees. Traditionally, the American model is considered less state-oriented for the development of CSR, while companies are the initiators of social programs for the development of society. Of course, the state has regulatory levers, but less represented than in European countries, which will be discussed below.

In our research, we will focus on the experience of European countries through the extensive experience of government intervention that can be applied in Ukraine. Thus, Shevchenko O.V. notes that the promotion of CSR principles in Europe began with the formation in 1995 of the European Business Network (CSR Europe), which engaged in the dissemination and promotion of CSR principles. The CSR principles were formally presented at the Lisbon European Summit in March 2000[2]. Experience has shown that EU governments are active in promoting CSR. The main initiatives are presented in table 3.

Table 3. The main initiatives of EU governments in the field of CSR development

Document Title	Characteristic
"Green Paper"	The European CSR Framework Policy is presented, according to which the government develops national policies, including mechanisms and tools to support best practices and innovative ideas.
"EU Environmental Plan"	The main directions of activity of the states of the European Union in the field of environmental protection are fixed.
"Integrated Product Policy" ("IPP")	It is designed to monitor the impact of production processes on the environment and stimulate the introduction of the most efficient methods of production.
"General system of eco-management and audit" (EMAS)	It recommends a system of evaluation and reporting on CSR and is aimed at implementing environmentally friendly management in the compan's activities.
"European Environmental Efficiency Initiative" (EEEI)	It is aimed at integrating the principles of environmental efficiency into industrial and economic strategic plans of companies.

[2] O.V. Shevchenko, *Rehulyuvannya polityky korporatyvnoyi sotsia'noyi vidpovidal'nosti: praktyka krayin-chleniv Yevropeys'koho Soyuzu*, „Aktual'ni problemy mizhnarodnykh vidnosyn" 2014, no. 122, Issue 1, pp. 12-21.

Document Title	Characteristic
European Parliament resolution "EU standards for European companies operating in developing countries: towards a European corporate code of conduct"	It proposes the creation of a European standard corporate code of conduct.
Europe 2020: A strategy for smart, sustainable and inclusive growth	New directions of CSR development in the EU are presented.

Source: compiled by the author on the base of: O.V. Shevchenko, *Rehulyuvannya polityky korporatyvnoyi sotsia'noyi vidpovidal'nosti: praktyka krayin-chleniv Yevropeys'koho Soyuzu*, „Aktual'ni problemy mizhnarodnykh vidnosyn" 2014, no. 122, Issue 1, pp. 12-21; O.V. Bodnaruk, *Yevropeys'kyy dosvid derzhavnoho rehulyuvannya korporatyvnoyi sotsial'noyi vidpovidal'nosti*, „Menedzher" 2016, no. 2, pp. 41-48.

Thus, we could observe that the EU's policy is aimed at developing CSR. Moreover, if it had a more environmental aspect earlier, recently, it is already focused on other aspects of CSR, such as corporate code of conduct or the development of new directions of CSR.

The tools and mechanisms to encourage socio-economic behavior in the European Union depend on the goal of the development of CSR in a given country and take a range from incentives to strictly regulated requirements and actions. The following table presents a detailed overview of the experience of state regulation of CSR in European countries.

The example of Great Britain is most interesting for scientists due to the active state policy in this field such as the position of Minister of Corporate Social Responsibility, CSR development activities, support for businesses that develop social initiatives, etc. In the United Kingdom, the zeal of early 'CSR-niks' was tempered by the view that CSR would be useful to business if it could deliver business benefits. A strategic view of CSR is thus more prevalent among UK-based firms. The UK-based organisation Business in the Community (BITC) was established in 1982 in response to perceived failures of business against a backdrop of rising unemployment and urban rioting and attempts to integrate considerations of societal impacts into business strategy.

In Europe, environmental considerations prevailed and the concept of sustainability may be expressed more widely than the concept of

CSR. For example, environmental disclosures in company reporting are more prevalent than references to ethics[3].

The examples of other countries also differ from the positive experience that can be applied in Ukraine. The socio-economic responsibility of entrepreneurship in Ukraine can be developed through the use of governmental policy. First of all, more attention should be paid by government to legislative initiatives. A draft law "On Corporate Social Responsibility" should be developed, which will clearly formulate the main characteristics, principles, forms, directions, tools of corporate social responsibility, and provide an opportunity to inform the public and business community as well as clearly define the area of CSR. Secondly, the experience of European countries in supporting those enterprises that carry out social initiatives can be useful. This support can be expressed in preferential taxation of profits of the enterprise carrying out socially responsible actions. This manifests the socio-economic responsibility of entrepreneurship, i.e. obtaining economic benefits from social activities. To do this, the tax code should clearly describe the same changes that will be made. Examining the experience of other countries, the example of France, which made the non-financial report mandatory, is also useful. At some points, this experience can be adapted to our realities at large enterprises.

Thus, we could see that the value of social responsibility in the EU is rooted in governments. States are actively implementing various legislative initiatives to develop CSR, which is an incentive for entrepreneurs to be socially responsible and can also be extrapolated to the entire population.

Table 4. Directions of the European Union policy in the field of CSR

Direction	Main actions
Informing the public about the role of CSR in the development of society and best practices of socially responsible business	European governments are setting up special information centers, calling on the media to promote and discuss issues, as well as inform readers about best national and foreign CSR practices.
Encouragement and support of additional voluntary business initiatives in the field of CSR	Initiate and take an active part in the development and implementation of industry and corporate codes, which enshrine the basic principles of business ethics. One of the popular tools is the introduction of a mechanism for social and eco-labels.

[3] M. Dielini, *Different practices of socio-economic responsibility of business. Innovations in the development of socio-economic systems: microeconomic, macroeconomic and mesoeconomic levels: Collective monograph,* Izdevnieciba „Baltija Pubishing" 2016, vol. 3, pp. 164-178.

Direction	Main actions
Training, research and methodological support	Conducting seminars and trainings on CSR for civil servants, business representatives, members of public / trade unions, associations and unions, which continue to act as catalysts for the promotion of CSR.
Stakeholder involvement in CSR issues	The development of this area of public policy is related to assisting in the organization of dialogue and partnership between the state, business community, professional and public associations and other stakeholders in the implementation of CSR to consolidate resources and achieve more meaningful results.
International cooperation in CSR realization	To join forces and promote international CSR principles, governments support the initiatives of international organizations, including the UN Global Compact Initiative, by signing conventions, concluding agreements and participating in international forums.
Combining interests and transparency of socially responsible businesses	The EU promotes the development of international management standards, reporting indicators, CSR audits, stimulates certification of products and enterprises according to international standards, which, in turn, ensures the entry of national companies into world markets, promotes the system of international social and environmental labeling to ensure equal rights of trade in different countries. Recently, socially responsible investment (SRI) has become increasingly popular, which is based on taking into account the social and environmental consequences of investment when making investment decisions.
Introduction of CSR evaluation and reporting systems	With the support of the state, a methodological guide for reporting is being developed, and special structural subdivisions are being set up to assist in the preparation of non-financial reports. In some European countries, the inclusion of CSR information in regular audit reports is mandatory.
Use of tax and investment instruments	Creating favorable conditions in which socially responsible behavior of companies is rewarded through the provision of tax benefits, preferences, subsidies. Income from social expenditures, charitable donations, targeted contributions to non-profit organizations, funds in most European countries are not taxed. The state participates in the co-financing

Direction	Main actions
	of socially significant projects. The most important non-tax preference for socially responsible business is the consideration of CSR in the selection of enterprises to fulfill government orders.
Special CSR legislation	In some countries, special legislation has been created that takes into account the above tools to stimulate and regulate corporate social responsibility of enterprises.

Source: compiled by the author on the base of: O.V. Shevchenko, *Rehulyuvannya polityky…*, op. cit., pp. 12-21.

Thus, we can see that the EU government pays much attention to the development of CSR areas within the integration group, which are aimed at disseminating information about CSR, the results of activities and practices of enterprises in this area, and specifically the implementation of these tools, i.e. evaluation and reporting, the use of tax benefits and investment instruments to encourage CSR practices, as well as the creation of special legislation in the field of CSR.

As we mentioned before, Socially Responsible Investment (SRI) should be discussed from the perspective of European experience in this field, as a decision about such type of investment is based on responsibility of business towards society. Europe has a leading position by this type of investments in the world. In 2018 amount of European SRI was equal to almost 46% of all SRI in the world, showing a slow decrease from 52.6% in 2016 to 45.87% in 2018. So, it is a leader and a good example for our country[4].

The other good example is Sweden. It is traditionally considered as a country with a socially-oriented economy, and therefore the system of social responsibility is seemed to be at a high level. Turning to the numbers, we can present the following achievements of Sweden, recognized by the world community:

1. 2007 – Sweden topped the Responsible Competitiveness Index. This index was based on a range of parameters covering climate, working environment, corruption and social issues among companies in 108 countries. In particular, the report highlighted gender equality in Sweden.

[4] M. Dielini, *Trends in the development of socially responsible investing in the world: theoretical and practical aspects*, „Ekonomichnyi analiz" 2020, vol. 30, no. 1, pp. 74-83, https://nubip.edu.ua/sites/default/files/u317/stattya_dielini_ekonomianaliz_2020.pdf [10.10.2021].

2. 2010 – Climate Competitiveness Index 2010 acknowledges the Nordic countries to be in the forefront of combating climate change and promoting the development of 'cleantech', an umbrella term for innovations that reduce emissions or energy consumption.

3. 2010 – World Economic Forum's Global Gender Gap Report 2010 states that Sweden and the other Nordic countries "emerge as top performers and true leaders on gender equality (...) and thus serve as models and useful benchmarks for international comparisons"[5].

CSR in Sweden is a part of industrial policy, which objective is to strengthen competitiveness and create more jobs and growing companies. The issues of the Swedish Parliament linked to CSR include human rights, decent working conditions, environmental considerations and anti-corruption efforts, as well as gender equality, diversity, business ethics and taxation. All of them interconnected with SERE as they have economic base and as well some of them is a direct economic tool that influence business and society[6].

In table 5 main developments of Sweden's CSR are presented.

Table 5. Main developments of Sweden's CSR

#	Sphere of developments	Characteristic
1	Legislative	Sweden was the first country (2007) to demand sustainability reports from state-owned enterprises. The reports have to comply with guidelines from the Global Reporting Initiative (GRI).
2	Administrative	Since many years the government has made several attempts to encourage and inspire Swedish companies to engage in strategic CSR. The Ministry for Foreign Affairs has a platform for dialogue with business, social partners, labour unions and NGOs working with social responsibility and has during the past years organized and participated in several seminars about CSR including anti-corruption. The Swedish International Development Cooperation Agency (SIDA), a government agency, is increasingly working together with the private sector to stimulate development, innovation, entrepreneurship and CSR in developing countries. SIDA aims to contribute to the

[5] *Sweden leads by example in corporate responsibility*. *Facts about Sweden*, Swedish Institute, 2011, https://www.sweden.se/ [12.10.2021].

[6] *The Swedish Government policy for corporate social responsibility*, Fact sheet, Ministry of Enterprise and Innovation, 2016, https://www.government.se [12.10.2021].

#	Sphere of developments	Characteristic
		promotion of sustainable and inclusive business practices through its experience of operating in less explored trade environments.
3	Adjudication	There are specific laws in Sweden, civil and criminal, on health and safety, equal opportunities, right of collective agreement, corruption and discrimination as well as other human rights related to challenges.

Source: Table is compiled on the base of: *Overview of CSR developments at a national level*, CSR Committee, 2013, Issue 1, http://www.ccbe.eu/fileadmin/speciality_distribution/public/documents/CSR/CSR_Position_papers/EN_CSR_20130131_Overview-of-CSR-developments-at-a-national-level.pdf [12.10.2021].

Consequently, Swedish government takes some measures that increase the level of CSR, namely: mandatory social reporting of state-owned enterprises, the adoption of laws governing the economic instruments of CSR, the introduction of measures to extend social responsibility to the private sector and others. We can use the experience of Swedish government to diverse practices of CSR in Ukrainian reality. We also can observe powerful state support of CSR dissemination in this country that is typical for most European countries. And that can be a key point and strong foundation, because such value as responsibility is under control of state authorities.

If we turn to the other important value of the EU – inclusion, it should go in line with social responsibility. Considering the way of Ukraine to eurointegration, such value should be disseminated in the society and our everyday life. Social inclusion involves the full integration of people with special needs into everyday life, the creation of a system that enables them to become full members of society. This can be achieved through various means and instruments, among which we can highlight social responsibility, in particular corporate social responsibility, as a derivative of this core value of the EU. Social responsibility means responsibility for one's own actions towards society. This has now become widespread and important with companies disseminating their own solutions to social problems. Some of the methods companies can use to attract people with special needs to society include: providing jobs, training and educating these people, helping them in integration into the 'new' labor market and new occupations in this market.

Social inclusion should include not only the provision of jobs, but also the support of decent wages, education from the lowest level and full access to public services. Businesses can help in this direction by funding

social and educational projects that will promote the inclusion of those who needs it in the learning process; creating opportunities for internships in order to acquire practical skills, etc.

Additionally, CSR in this direction can be realized through financial support for the comprehensive development of these people either in professional or cultural, scientific, sports and other fields[7]. In this case, entrepreneurship is a chain that combines the values of social responsibility and social inclusion and helps to implement them with maximum efficiency.

The development of corporate social responsibility in the current context of the global economy and the spread of the COVID-19 pandemic requires research, as companies are currently unable to implement CSR on the same level as before the pandemic. Not only CSR was threatened by third-party external stakeholders, but also by its own employees, as a large number of companies were forced to work remotely or to reduce wages, which led to negative trends in Ukraine's labor market. Not only official unemployment, but also the shadow labor market has been affected.

After studying the literature, analytical and statistical sources, we can conclude that CSR during the pandemic did not stop, but acquired new forms of implementation. If most enterprises earlier implemented it in the form of social programs for community development, staff development, charity, etc., then nowadays it manifests itself in the form of charitable assistance, in the form of purchasing the necessary medical equipment, protection, drugs or material assistance. For example, Jack Ma, the founder of e-commerce giant Alibaba, donated 1 million coronavirus test kits, 6 million masks and 60,000 protective suits to African countries through his charity. The same sets were sent to the United States, Latin America and Asia. Among the benefactors other giants of the digital industry can be mentioned, i.e. Amazon, Apple, Microsoft, Facebook.

In addition, industrial enterprises have also found an opportunity to implement CSR to help quickly overcome the COVID-19 pandemic. Thus, such car companies as Rolls-Royce, Ford, Tesla, General Motors have provided their production facilities for the production of ventilators. Whiskey distilleries in the United States and the European Union, as well as perfume manufacturers, have provided their facilities for the

[7] L.V. Shynkaruk, M.M. Dielini, *Social inclusion and social responsibility as principles of the European dimension of inclusive education*, [in:] *Proceedings of International Round-table „Inclusive education and rehabilitation: partnerships, strategies, methodologies (Ukrainian and European Dimensions)"*, Kyiv–Kamianets-Podilskyi 2021, pp. 134-135.

production of antiseptics. Thus, we can see that the world companies have adapted various forms of CSR to the today's needs and challenges.

Among Ukrainian businesses, the following examples can be given: NJSC Naftogaz has allocated UAH 12.3 million to help doctors (purchase of personal protective equipment, disinfectants, medical equipment, respirators, masks, medical gloves, goggles). DTEK Naftogaz has purchased ventilators for hospitals. Arcelor Mittal from Kryvyi Rih has allocated over UAH 2 million for the purchase of ventilators, as well as repurposed the sanatorium to the observation base. We can also point out such a representative of the logistics business as Nova Poshta, which from the very beginning of the pandemic in Ukraine called on businesses to support Ukrainian doctors and raise funds to overcome the pandemic. In addition to providing financial assistance to Ukrainian doctors, Nova Poshta, in coordination with the President's Office, delivered medical supplies to hospitals free of charge. ROSHEN provided medical assistance in the form of purchase of more than 100,000 personal protective suits, 10 portable X-ray machines worth more than UAH 10 million, and in coordination with the Zhyttelyub project purchased goggles, gloves, and food kits to help the elderly, which are the most vulnerable group. Kyivstar, Vodafone Ukraine, SoftServe and other companies operating in the domestic market also provided CSR in the form of assistance to support physicians and medical institutions.

Thus, we see that CSR did not lose its relevance during the pandemic, but changed its forms of manifestation. Businesses have refocused their environmental, educational, and other programs on today's needs and focused their assistance on purchasing the necessary equipment, medical supplies, or providing targeted financial assistance. This positively characterizes domestic enterprises, as they understand the importance of CSR implementation and disseminate these practices in acute socio-economic moments.

Examining all the above, we see that the social responsibility of both the individual and business is a value of the EU, which is a category that has evolved since ancient times, but it is now actively supported by states. That is, the state acts as the regulator that causes the development of CSR and allows this value to be realized in practice, because business is responsible not only to its employees, but also to society and consumers.

If we extrapolate CSR to ordinary social responsibility of every personality, it is clear that it is brought up in EU citizens in two aspects: first, the upbringing of parents, and secondly, incentives from the state. As a result, the EU has reached a level that is one of the most successful integration units in the world, combining developed countries with effective government and business practices.

For Ukraine, the experience of the EU in this aspect becomes unconditional and worthy of imitation, because social responsibility in our country does not have such a development as it has in the EU or as it should have. This is due to many aspects and historical evolution of our state, but given the current direction of development, it is necessary to spread these EU values to become a strong and stable state, to achieve the Goals of Sustainable Development.

Both the experience of the United Kingdom, which was a member of the EU and introduced the post of Minister for Social Responsibility, and the experience of Sweden, which has required mandatory reporting to state-owned CSR companies, can be useful. In general, the experience of the whole EU is positive, because each country develops a CSR development policy that is most convenient for it and meets its national interests.

A developed socially responsible society can be formed when all members of society are socially responsible, and since business is an important part of it, it can form the basis for sustainable development and the importance of social responsibility as the highest value of the EU.

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COGNITIVE FOCUS OF SOCIAL COHESION DEVELOPMENT TECHNOLOGIES AS INCLUSION AND ADAPTATION STRATEGIES

The new social technologies are in the center of the convergence trend. The new stage of the convergence is NBICS – nano, bio, information, cognitive and social technologies, where the social technologies are playing the more and more important role. Their impact on the development of social cohesion and inclusion is quite substantial. It should be noticed that the technologies of cohesion, management technologies, construction of common behavior patterns have recently changed significantly. The first large-scale changes were caused by digitalization, and above all the World Wide Web. The opportunity to communicate with like-minded people from other parts of the globe was previously available only to the chosen ones – diplomats, radio operators, politicians, the military. But with the development of the Internet, the world has become not such global as local. Online communication between ordinary people from different countries and even continents has opened up completely different areas and types of social communication.

The social communications correspondent to the modern world, which is very fast and unpredictable in changing the complex system. Thus, humans need to change its adaptation strategies because of different cognitive and evolutionary nische. The digitalization has been accelerated not only by NBICS convergence but pandemic's impact. The Big Data, Internet of Things, Augmented and Virtual Reality, 3D manufacturing and Artificial Intelligence – the list to be continued. Socio-economical global crisis sharped by pandemic challenges demands for the new innovation approach to boost the future creative economics and sustainable society, accordingly. First of all, this is a challenge for the system of education – formal and informal. While the concept of "triple L" (LLL) – long life learning is suited to the innovative creative society. Anyway, it provides changes in the educational system that is a creative one. This is

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not only specially coursed for the development of creative tools and approaches. The main task of modern education (in particular, higher education) is to prepare new learners for the current global realities. The core problem is not only in instrumental digital changing of the cognitive niche of humans. The problem is in dividing society and separating generations from each other. Especially young people who are living in informational, digital society, mostly in virtual reality. Older people are less successful 'digital migrants'. It is the first time in the history of mankind when the experience, knowledge of older generation is almost useless, and they have to learn from their children (or more often from grand-children). It's clear that the social reality is characterized by the high level of uncertainty. It actualizes the problem of proper decision making and creative thinking. New generation needs higher order of thinking, and higher cognitive effectiveness, accordingly. Mainly, it concerns creativity and creative thinking. It's obvious that the forming of creative economy demands creative actors. Thus, it leads to the problem of proper changes and innovations in the educational system. Education policies and curricula aim to incorporate a broad range of skills and competencies necessary for learners to successfully navigate the changing global landscape. 'Transversal competencies', sometimes referred to as '21st Century skills', are broad based skills that aim to meet these challenges, such as technological advances and intercultural communication. Education policies and curricula aim to incorporate a broad range of skills and competencies necessary for learners to successfully navigate the changing global landscape[1].

The task to increase the personal and collective cognitive effectiveness actualizes the deeper investigations in the cognitive sphere. Nowadays the cognitive approach is starting to be even more popular than synergetic one. The modern science, answering to demands of complex socio-economic situation, actualizes holistic principles. The information-cognitive paradigm of education is very perspective. Many complex and difficult problems should be specific to our thoughts and their solving should be based on the knowledge of our brain's principles. These principles and their practical researches are the matter of cognitivistics. Cognitivistics is the complex conglomerate of cognitive researches, which is structuring as complex hyper net with the non-linear dynamic of development. This is Whole Complex Unity of cognitive sciences, cognitive technologies and cognitive practices.

[1] *Classcraft makes the classroom a giant role-playing game — with freemium pricing*, http://venturebeat.com/2014/05/31/classcraft-role-playing-classroom [09.09.2021].

The author's definition of 'Cognitivistics'[2] (which is different from the regular definition of Cognitive Science) reflects the complexity of this phenomena and the actual stage of modern science. Accordingly, it is more useful for the description of holistic principles of science and education.

There is already exists the new model of global education – mass open online courses (MOOC), which are planning to educate not less then billion people. The MOOC changes the system of education not only because it makes education free of charge and available for all people. The MOOC allows to pick up the talented guys not at 21 years, but at 12 years old, at school. Facebook is already finding in these guys, for instance from India and Mongolia. Their competences are key factors for employers. This competence is commonly used in the human resources management (recruitment and assessment processes). But now we can see the transfer of this approach from business to education and social spheres. It's caused by fast growing digital information technologies with their visual, dynamic, easy ways of information providing. It could be noticed in social media that forms of presenting information, even text, are becoming increasingly 'visual-metaphoric', is gradually shifted towards the iconography, not to more complex texts. This process of visualization helps to reduce social exclusion and allows the equal access to the social virtual networking.

To increase the inclusion level, in the future, the new model of education as social adaptation and carrier development assistance will be deeply connected with defined trajectory of individual development. It is necessary to form a systemic picture of the world based on the technology of thinking and system subjects (foreign languages, mathematics, music); social management skills; managing mental and physical state and development of the body. Accordingly, these complex education models should be supported by information technologies. According to estimates it should consist of online courses and the library knowledge, simulation and multiplayer role-playing games and simulators biofeedback and neuro-computer interfaces. By the way, all this is already in practice in terms of different ways of learning.

The conception of embodied mind is under discussion in the light of nonlinear dynamics and co-evolution of complex systems developed by the Moscow scientific school. The cognitive architecture of the embodied mind is rather complex: data from senses and products of rational thinking, the verbal and the pictorial, logic and intuition, the analytical

[2] M. Nesterova, *Kohnytyvystyka: ystoky, vyzovy, perspektyvy: monohrafiia*, Unyversytetskaia knyha, Sumy 2015, http://enpuir.npu.edu.ua/handle/123456789/19818 [08.09.2021].

and synthetic abilities of perception and thinking, the local and global, the analogue and digital, the archaic and post-modern are intertwined in it. In the process of cognition, co-evolution of embodied mind as an autopoietic system and its surroundings takes place. The perceptual and mental processes are bound up with the structure of human body. Nonlinear and circular connecting links between the subject of cognition and the world constructed by him can be metaphorically called a nonlinear cobweb of cognition[3].

One of the most popular social cohesion development technologies is based on using of the most powerful visual cognitive channel. All these technologies aimed for the creativity development. Also they deeply involve students in interactive processes of teaching & learning for better results in education for better cohesion, teambuilding and social intellect training.

The objective of the above approach belongs to implementation of ICT technologies of visualization (successfully applied in the gaming, design, marketing & business spheres) into the high education. There are technologies of video scribing, doodle video, serious games, graphic facilitation and art scribing which could be successfully connected with teaching & learning processes. They will help to increase a cognitive effectiveness, social cohesion in education, motivation and involvement in teaching & learning processes. These techniques will allow starting education from the youngest students and successfully educating them by creating learning dimension. Also this approach will help to solve the problem of social cohesion by education of various groups of students (with different social and cognitive styles).

The another area of changes in the education system, which are caused by certain currents, can be attributed to the field of cognitive science. It is insufficiently recognized training techniques that use a holistic approach to the process of cognition, including corporeity and embodied cognition.

One of the founders of this approach, which was not sufficiently used in education, is M. Feldenkrais. His approach cannot be called pure education, it is also psychosomatic, aimed at healing. Thus, instead of 'repair' or 'correct' the body, M. Feldenkrais learns to extend his ability to use the choice of possible actions. But it is also an approach to learning. Feldenkrais is known for the development of systems such as 'Functional integration' and 'Awareness through movement'. Both are based on physical approach to learning and self-knowledge. Perhaps the most promising developing direction is awareness through movement (ATM).

[3] *Mezirow's Ten Phases of Transformative Learning*, https://sites.google.com/site/transformativelearning/elements-of-the-theory-1 [11.09.2021].

Feldenkrais emphasizes the need to learn to relax, to find your own rhythm, and to overcome the negative physical patterns. Our development in childhood occurs through play, so this basic principle of education should not be neglected. In order to learn something new, to clear, to play, to experiment with movement. Not only in neurophysiology, but in the classical pedagogy it is proved by the fact that while we are under pressure, stressed, in a hurry, we can't learn. Under the stress, we just repeat old cognitive patterns[4]. Such cognitive practice that offers Feldenkrais, aimed at restoring relations between motor cortex areas of the brain and muscles, which had a negative impact. Thus, it should be a comprehensive look at sensory-motor functioning of the body and its connection with thinking, emotions and actions. The theory of Feldenkrais was in tune with the Eastern idea of unity of mind and body, intention and action.

This holistic approach is supported by other effective social cultural technologies, some of them are not new. For instance, the predecessor of modern visual presentation technologies (Microsoft Power Point or Prezi) is Kamishibai theatre. Kamishibai is a part of an ancient visual storytelling tradition that originated during the 12th century in Buddhist temples in Japan (kami = paper, shibai = drama; paper dramas). Monks used picture scrolls to pass moralistic stories to a largely illiterate audience. Traditionally, it is a small theatre box in which large prints can be inserted. On the back of these prints is a story that the kamishibai narrator reads or tells: image and language coincide perfectly. A kamishibai story is reminiscent of delayed animation. For thirty years, from 1920 to 1950, this narrative technique was all the rage in Japan; it was the forerunner of the popular manga culture. For the past several years, this unique narrative form has made a global comeback not only in Japan but also in Europe. Kamishibai stories for educational purposes are still being published and can be found in schools and libraries throughout Japan and more recently, through the efforts of *Kamishibai for Kids*, in the United States and Canada (www.kamishibai.com). It is connected with the social cohesion and inclusion development in terms of morality and sense making. To accelerate the awareness, a sense making competence, it is necessary to increase the level of the cognitive ability. And one of the efficient methods is implementing of philosophy (training). This approach is well-known in the pedagogics. Philosophy For Children (P4C) is a worldwide educational movement that began in 1972 with the work of Professor Matthew Lipman and colleagues at the IAPC. Lipman wrote special 'philosophical novels' for use with children and compre-

[4] *Classcraft makes the classroom a giant role-playing game — with freemium pricing*, http://venturebeat.com/2014/05/31/classcraft-role-playing-classroom [09.09.2021].

hensive 'manuals' of accompanying resources. He also suggested the 'community of inquiry' as an appropriate method and aim of P4C. Now Philosophy for Children is practiced in more than thirty countries around the world (www.P4C.co.uk). Doubtless, this approach with the proper impact of visualization should be implemented (in accordance with the age psychology and axiology) into the system of high education. Luck of values platform for the successful adaptation and personal self-development of youth is one of the most fundamental and painful problem nowadays. The above mentioned transversal competences include sense-making competence as the important one of them.

In general, the main goal of education is to adopt student to the successful activities in the complex, unstable society (do not forget about challenges of the virtual and augmented realities). Currently, no consensus has been reached for referring to non-academic skills, non-cognitive skills, 21st century skills, or transversal competencies, and this is reflected in the reports from the respective countries and economies. In the report from the Philippines, the term 'non-cognitive skills' was used. In the report "Future Work Skills 2020" the Phoenix Research Institute has identified these transversal skills and defined them in ten large blocks of competences"[5]. These competences are as follows: sense-making, social intelligence, adaptation thinking, intercultural competences, computational thinking, transdisciplinary, design mentality, cognitive load management, virtual collaboration.

The European educational policy is oriented for the development of these important and useful skills. Strategic thinking is very important cognitive competence but it is transferred to the more complex and actual competence of Sense-Making. We can define it as the ability to find the deepest or most significant meaning of what is being expressed. That means the competence to synthesize the key points that help to create a unique viewpoint before taking decisions. This is a sort of 'mix' between strategic thinking, proper decision-making and creativity. Meanwhile, Interactive Visual Communicative Technologies should be the most important tool in the process of development and dissemination of sense.

The integral parameters of successful interpersonal communications form the competence of Social Intelligence: the ability to connect with other people deeply and directly, to detect and stimulate the desired reactions and interactions. Socially intelligent employees know how to rapidly evaluate the emotions of people around them and adapt their words, tone and gestures. As a result, this is a key skill for working to-

[5] G. Delanty, *The University and Cosmopolitan citizenship*, "Higher Education In The World 3/ Higher Education: New Challenges and Emerging Roles for Human and Social Development", Global University Network for innovation, New York 2008.

gether and building relationships of trust, and it is necessary for getting along with groups of people in different contexts.

The information society demands the competence of Computational thinking: the ability to translate large amounts of data into abstract concepts and to understand reasoning based on data. As the available data increases exponentially, many more functions will require computational thinking skills in order to make sense of this information.

In the behavior economics within managing cognitive patterns of social activities, there is a very actual competence of Mastering the new media: the ability to evaluate critically and to develop a content that uses the new media forms, using those media for persuasive communication. The coming generation of workers should have fluent competences in different formats such as video, be capable of 'reading' and evaluating information critically, and communicating through a number of different channels.

The modern reality demands to become an expert in recognizing what way of thinking each task requires and reconditioning the working environments to improve that ability to carry them out. So, very important is the competence of Design mentality: the ability to represent and to develop tasks and work processes in order to get results.

In conditions of unlimited flows and dimensions of information extremely useful is the competence of Cognitive loads management: the ability to discriminate and filter out the important information, and to understand how to make the most of current knowledge by using a variety of tools and techniques. Everyone has to develop their own technique to deal with the problem of cognitive overload.

In the nearest future the most appropriate competence will be Virtual collaboration: the ability to work productively, to enhance participation, and to demonstrate a presence as a member of a virtual team. ICT makes it easier than ever to work, to share ideas and be productive in spite of physical separation[6].

The competence of 'Virtual collaboration' is deeply connected with the social cohesion and social inclusion development. The new digital technologies should help to transfer the existing social principles (patterns) of behavior to the virtual dimension.

Nowadays we can see the speed-up of Internet-based training games. They seems to be a new frontier of cognitive enhancement. Also these kinds of games open unprecedented virtual territories, new dimensions of cognition. But their manifesting promotion is the matter of ethical issues. And only well tested games could be implemented into the

[6] *Ten transversal key competences*, https://jobfraternity.wordpress.com/2015/07/20/ten-transversal-key-competences [10.09.2021].

education sphere. The question of Internet addicition is still open. So, there are, possibly, more safe types of cognitive trainers. For example, BrainHQ is a brain training system built and tested by an international team of more than 100 top neuroscientists and other brain experts. The exercises aren't only 'scientifically designed' — more than 70 published papers (and counting) show real benefits from using them (www.brain hq.com). This is the way of cognitive training, using mental exercises but there is a way of cognitive enhancement by external devices. A leader in the development of such devices and specialized software has become the company Neurosky (www.neurosky.com). It's not only devices for individual use and entertainment. In the format of corporate training of employee's company already offers a programme of Home Of Attention (HOA). This is a professional program created by experts in the field of psychology and studies of the human brain, mental training for states of consciousness: relaxation, concentration, etc. The prospects of using the software and these devices are impressive, although, as with every innovation, there are risks of its use. For example, the same device can be used not as voluntary detection of mental states. This is a matter of ethical challenges of cognitive science, which requires separate, detailed consideration, especially in the field of education. All terms broadly refer to and encompass skills, competencies, values, and attitudes required for the holistic development of learners, such as collaboration, self-discipline, resourcefulness, and respect for the environment[7]. These competencies are lead to the social cohesion development, allowing to improve the whole level of social inclusion, based on trust and other social values.

The sample of the transfer of social technologies into the digital dimension is one of powerful projects supported by EU within the frame of the Seventh Working Programme of Horizon 2020 – "Idea Garden". This is the project based on motivation to better support creative practices and the goal to bridge the gap between traditional, often fuzzy, nonlinear work practices and the available ICT infrastructure. The idea is to implement a creative learning environment which will consist of state of the art hard and software technologies that assist during all phases of the creative process (http://idea-garden.org/). This is a response of educators to the demands of creative economics. Nowadays, because of pandemic restrictions, it could be considered as the best practice of social technologies and social cohesion development by the way of social interactions not only in the creative economy sphere.

The problem of new social technologies is very actual because of increasing challenges of current social problems. In particular, the prob-

[7] H. Knyazeva, *The Cognitive Architecture of Embodied Mind*, „International Journal of the Humanities" 2011, vol. 8, Issue 12, pp. 1-10.

lem of social cohesion is exacerbated by migration and pandemic crises. These crises sufficiently impact on European integration processes, social stability in EU and worldwide. It is necessary to find methodological foundations for the implementation of new approach in the social innovations and educational systems. This approach should be based on the recent achievements of cognitive researches, neurosciences, social/ communicative educational technologies implementation, etc. It should be taken into the consideration that practical educational tools also need to be upgrade according to the recent innovations. It means that cognitive technologies (i.e. Interactive Visual Communicative Technologies – IVCTs) both as advanced courses and important educational tools could be implemented into the system of high education in Ukraine. This process should be based on the relevant aspects of European educational policy (including social cohesion and transversal competences studies). The main task is the dissemination of this direction of educational policy cognitive principles. For this purpose, it is important to promote discussion and reflection on EU issues, including understanding the concept of the European high education policy, its fundamental principles, Ukrainian opportunities to implement the European experience via discussion, learning of theoretical materials and practical tools.

Social innovations should be based on the latest scientific researches, approaches and technologies. Therefore, the one of the most perspective direction is a cognitive one. Cognitive technologies are based on multimodal learning, embodied cognition and interactive framework. Cognitive technologies aimed to cognitive effectiveness improvement not using of new neuroethologies (neurodevices) but training of various mental abilities (neurobics, eidetic and mnemonics). Cognitive technologies based on practical technologies of interactive communication (facilitation, mediation, active-learning based case studies, serious games, etc.) increase the level of cohesion and inclusion accordingly. Modern community development technologies include the virtual aspects. Implementation of the IVCTs has to take into consideration the basic cognitive mechanism. This cognitive mechanism is the game – through the game, as shows evolutionary epistemology, a person learns and develops. In addition, the game is one of the most emotionally deep, exciting process not only for children and young people but also for adults. This specificity of our cognitive system is successfully taken into account in 'the experience economy', and 'economy of entertainment'. The existing trend of development of social reality reflected in this area – 'virtual offset': more and more games are transferred to virtual reality, and even in the space of social networks. The development of technology speeds up this process – right now there are gamers' devices that combine the real physicality of the player with a virtual 'avatar'. Helmets for the other sen-

sory experiences of reality are improving very quickly, along with a variety of devices that enhance our cognitive capabilities (for example, see or hear in the human range). But even without these devices a virtual game captures an increasing number of people. According to estimates of the Association of interactive computer programs back in 2006, they played about 146 million people, representing 60% of the US population[8].

Gamification is intensively spread in the education system. An important aspect of applying a particular category of games (including in education) is in focus of interests of the company Serious Games – the Serious Games Society (www.seriousgamessociety.org). Last year the Serious Games Society conducted the international conference on The Games and Learning Alliance conference (GALA 2015), which was dedicated to scientific and applied researches and developments in the field of 'serious' games. They are considered as a useful and effective tool for better learning, study, training, and evaluation in the education system. Sure, they could be considered as the brightest sample of interactive virtual technologies, leading to the social cohesion and social inclusion development.

It is worthnoting that the above cognitive technologies are aimed at the involvement and motivation for learning of youth. Video and graphic are deeply connected with young people. Multimedia whiteboard videos aren't just fun – they're shown to grab attention, invite engagement and boost retention for exams. Also it will help to empower teachers by using visualization in cognitive technologies (VideoScribe in particular) to illustrate complex ideas. They will bring dry topics alive, teach storytelling, design and media, to learn IT skills. The results of the application of the above cognitive educational technologies – new educational tools, new approach for subject education, methodological courses for supervision and upper-qualification of teachers (especially of high education schools). All these technologies will positively impact on creativity and social cohesion development of all subjects of educational and social sphere. This way of learning is similar to instrumental learning and doesn't solve many actual communicative, psychological and social problems. They are seemed to appear nowadays and continue at least at the nearest future. So, it's necessary to implement into the educational system the different approach – more holistic and compatible with the actual social challenges. This is the transformative learning approach.

This approach based of Transformative Learning Theory was developed by Jack Mezirow of Columbia University after researching factors related to the success, or lack of it, and women's reentry to commu-

[8] G. Small, G. Vorgan, *Brain on-line. Human in the Internet epoch*, translated by B. Kozlovsky, KoLibry, Azbuka-Atticus, Moscow 2011, p. 102.

nity college programs in the 1970's. He revealed that a key factor was perspective transformation. He described 10 phases of transformation process and argued that transformations often follow some variation of the following phases:

- A disorienting dilemma;
- A self-examination with feelings of guilt or shame;
- A critical assessment of epistemic, sociocultural, or psychic assumptions;
- Recognition that one's discontent and the process of transformation are shared and that others have negotiated a similar change
- Exploration of options for new roles, relationships, and actions;
- Planning a course of action;
- Acquisition of knowledge and skills for implementing one's plan;
- Provision trying of new roles;
- Building of competence and self-confidence in new roles and relationships;
- A reintegration into one's life on the basis of conditions dictated by one's perspective[9].

These phases are very typical for the social interactions in the general sense. The first phase was a disorienting dilemma. The next two phases are important aspects of the second of the theory's themes – critical reflection. The next phase represents the third of the theory's themes, rational discourse. Exploring with others the newly discovered "misfit" between your premises and your environment. The above phases are connected with the process of self-reflection, which increases the personal awareness, starts the meeting with the inner side of personality. And this process of the self-identification is the beginning of social communication. This transformative approach specifically consists of:

- recognition that one's discontent and the process of transformation are shared and that others have negotiated a similar change;
- exploration of options for new roles, relationships, and actions;
- doug's discussions with his group allowed him to explore this "misfit" how competition wasn't always the best approach to performance situations and explored other potential roles or approaches[10].

The modern society, oriented on to the competitiveness and "success race", should be changed to the society of support and cohesion. Therefore, this finding balance approach is really suitable for the transformation way. So, finalizing main principles of the transformational learning and the difference between instrumental and transformational

[9] *Mezirow's Ten Phases of Transformative Learning*, https://sites.google.com/site/transformativelearning/elements-of-the-theory-1 [11.09.2021].
[10] Ibidem.

learnings we can share the following suggestion: "Instrumental learning is the acquisition of skills and knowledge (mastering tasks, problem solving, manipulating the environment: the 'how' and the 'what'). In contrast, transformative learning is perspective transformation, a paradigm shift, whereby we critically examine our prior interpretations and assumptions to form a new meaning of the 'why'. This perspective transformation is achieved through (1) disorienting dilemmas, (2) critical reflection, (3) rational dialogue, and (4) action"[11].

Cognitive approach to social cohesion and social inclusion development leads to the concept of cognitive effectiveness and how to reach it through cognitive technologies. It includes topics of creative thinking, teambuilding abilities, effective decision-making, engagement in the learning and teaching processes, cognitive skills improvement, etc.[12] The perspective direction of further researches is to find a methodological base for the platform of realization of innovative services for educational programs: integration of flexible teaching methods, the latest hardware and software, digital 3D-objects and multimedia content and elements of augmented reality.

Actual approach is concerned about development of cognitive skills and mental effectiveness. Neurobics, brainfitness, cognitive fitness – there are a sufficient number of definitions of this popular trend of modern cognitive technologies. Cognitive fitness today already allows online 24 hours a day to develop attention, analysis and memory through simple exercises, completing quests and tasks contained in mobile applications. So, these services are presented by the project "Lumosity" (www.lumosity.com). This a one of the biggest project at this field.

The principle of similarity of physical and mental training approaches is the basis of 'neurobic' – special exercises for 'mental muscles'. Neurobics are mental exercises, that claim to enhance the brain's performance. The founder of neurobic L. Katz believes that all cognitive skills are possible to train only a properly chosen shape and type of exercise. This approach distinguishes brainfitness, which is becoming increasingly popular. Recently effective methods of developing 'mental muscles' were available only to experts and can be used only in areas equipped with expensive professional equipment. But now the situation has changed dramatically. This is because in the market there were devices, such as the company's Neurosky is capable of receiving the EEG signal with the medical accuracy of 96%. This means that the brain response can be accurately determined in real time. The development of

[11] Ibidem.

[12] M. Vertgamer, *Productive Thinking*, translated by M. Vertgamer, Progress, Moscow 1987.

technology, which contributed to the formation in fact most of cognitive science, came out in the purely practical sphere, became available to end users. Devices that allow you to monitor their level of concentration, neurogarniture, neuropressure toys, detectors of emotional state. The spectrum of these devices is only expanding. Through the use of cognitive exercises, Brain-Starter (one of Neurosky's innovative products) can improve ability to relax, focus and concentrate (www.neurosky.com).

It helps to train very important social interactions skills (memory and attention) in the on-line format. The social cohesion and inclusion development problems during pandemic transferred to the virtual dimension. With the progress of science and technology, virtual teams are becoming popular in organizations and corporations. However, how effective they regard performance, compared to traditional teams is what the researchers are interested in virtual teams. Covid-19 shows that due to the lack of face-to-face exchange, virtual teams' members need more communication channels (they rely on emails, phone calls, teleconferences, virtual meetings, etc.). For members of a virtual team, working with a teammate whom they never met personally is like interacting with a stranger in a social situation. Thus, it is harder to establish trust in the virtual teams. Another important characteristic to have for effective performance in any working groups is cohesion, which influences on to the group (team) performance. Some researches reveal that cohesiveness and trust in virtual teams play a major role in the relationship between effective coordination and team performance[13]. So, it is necessary to determine the basic principles of them and the possible transfer to the digitalized communicative space.

Also it is important to check the enhancement of social technologies by neuro and cognitive achievements. Now it's seems easy to believe that we will be witnesses of the revolution of cognitive technologies. After 2017 we get the massive proliferation of the neural interface (ASI already engaged in the development of the foresight of neuronet, which eventually will replace the Internet). This is due to the construction of network protocols at the level of the brain-computer and computer-brain in a variety of fields. Perhaps, only now the neural interface is still at a stage of initial introduction into the practice of education. Many neuroscientists suppose that after 2020, a significant impact will have the new psychopharmaceutic. Already received enough data on the biochemistry of the brain and the impact on its business of a significant

[13] B. Banchongraksa, D. Burchfield, J. Truong, Ch. Chieh Lu, R. Narayanan, *Managing Virtual Teams: Trust and Cohesion*, Engineering and Technology Management Student Projects, 29 (2016), http://archives.pdx.edu/ds/psu/21333 [1.09.2021].

number of drugs, from synthetic hormones to the well-known to us food products.

But the another way of cognitive development and its social dimensions in the patterns of human behavior seems to be more perspective. It reflects in the new trends of education (formal and informal). Nowadays we can notice the one of them – a new direction in the education, either using a human body as a cognitive tool or external (or, possibly, internal in the future) neurogarniture. This is direction of increasing awareness, which is the engine of cognitive effectiveness. Awareness in education and social life in general is very important thing and cognitive base of many important social technologies. In particular, it could be considered as the main part of trust and cohesion development which are lead to the increasing of social inclusion level. Awareness of values, trust and cohesion as the powerful cognitive tool should be applied at the metha level – for the assessment and improvement of the whole educational system and sustainable developments principles in the complex social reality. We can consider an awareness as one of the most important holistic principle of informational-cognitive paradigm of modern education. During the period of lockdowns because of pandemic's threats all social cohesion and cohesion technologies have been verified by virtual forms of communication, fast growing 'digital migration'. This trend actualized the research of the main principles and their cognitive foundation of social cohesion and social inclusion development. The key roles of science and education have been obviously demonstrated.

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Jarosław GALICKI*

THE IMAGE OF THE PODLASKI VOIVODESHIP KNOWN AS "THE GREEN LUNGS OF POLAND" IN THE CONTEXT OF DIGITAL CHALLENGES OF THE FUTURE

The area of north-eastern Poland is widely associated with the 'Green Lungs of Poland'. This ecologically clean area covers the Warmińsko-Mazurskie Voivodeship, the Podlaskie Voivodeship, the northern part of the Mazowieckie Voivodeship and eastern borderlands of the Kujawsko-Pomorskie Voivodeship; in total about 20% of the territory of Poland. Thus, the whole area of the Podlaskie Voivodeship falls within the area of the 'Green Lungs of Poland'.

The Podlaskie Voivodeship deserves the above-mentioned name due to the assets occurring in this region: 31,6% of its area is covered by various nature conservation forms, including: 4 national parks, 3 landscape parks, 93 nature reserves, 15 areas of protected landscape, 273 ecological areas, 1998 monuments of nature and 37 areas of the European Ecological Network Natura 2000[1]. Forestareas constitute 31,3% of the voivodeship.

Moreover, many species of fauna and flora are covered by legal protection. Overall, 377 species of animals are protected, 350 of them – strictly protected, 22 – partially protected, 5 – partially protected with a possibility to source. Overall, 218 species of plants are protected, 159 of them – strictly protected, 45 – partially protected, 14 – partially protected with a possibility to source. Fungi and lichen are also covered by protection. Overall, there are 91 species, 81 of which is strictly protected,

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[1] J. Pietrzak-Zawadka, J. Zawadka, *Atrakcyjność turystyczna obszarów chronionych w województwie podlaskim w opinii jego mieszkańców*, „Studia Ekonomiczne i Regionalne" 2018, no. 3(11), p. 71, https://www.wrotapodlasia.pl/pl/ochrona_srodowiska/ochrona_przyrody/ [05.06.2021]; G. Ślusarz, M. Cierpiał-Wolan, B. Gierczak-Korzeniowska, J. Uchman, P. Żegleń, *Potencjał turystyczny i jego wykorzystanie w latach 2014-2018 – ujęcie regionalne*, Urząd Statystyczny w Rzeszowie, Uniwersytet Rzeszowski, Rzeszów 2019, p. 35, https://rzeszow.stat.gov.pl/publikacje-i-foldery/sport-turystyka/potencjal-turystyczny-i-jego-wykorzystanie-w-latach-2014-2018-ujecie-regionalne,5,1.html [05.06.2021].

and 10 – covered by partial protection[2]. 4 out of 23 Polish national parks are located in the Podlaskie Voivodeship. Each one is remarkable in its own way:

- Białowieża National Park – is the oldest Polish national park. In 1921 the 'Reserve' forestry was created, later in 1932, it was renamed as 'National Park in Białowieża'. It has been named as Białowieża National Park since 1947, which is inscribed on the UNESCO World Heritage List. Its territory covers 10 517 hectares, it is situated in the forest complex of Białowieża Forest, which has a surface of around 1 250 km^2. The whole ecosystem occurring here is unique, but it needs to be emphasized that the park protects the last natural forest with a primeval character in Europe. The European bison is the symbol of the park.
- Biebrzański National Park – is the largest and longest national park in Poland. It covers an area of 59 223 hectares, and the distance between its fringes shall be almost 100 km. The park protects unique marshes and vast peat bogs, which occur in Poland. The park is a home for many protected species, and its symbol is an elk.
- Narwiański National Park – has a territory of 6 810,23 hectares. It is situated in the upper Narew River Valley. It stretches for about 50 km, with a width between 2 and 4 km. Its distinguishing feature is a mosaic system of flood waters. It constitutes a sanctuary for many swamp plants and animals; the symbol of the park is a marsh harrier.
- Wigierski National Park – has an area of 15 085 hectares. Its territory covers the northern part of Augustowska Forest, including water systems of 42 lakes with the largest one – Lake Wigry. Landscape diversity characterizes the park. The northern part of the park is hilly with numerous moraines, oasis, streams, the southern part is flat and overgrown with forests.

The Podlaskie Voivodeship also has 3 landscape parks within its area:

- Knyszyn Forest Landscape Park – is the third largest park by the area (i.e. 74 447 hectares) it's covers in the country, and with a buffer zone of 126 702 hectares. The park is rich in plants – 38% of

[2] https://www.zielonewrota.pl/index.php?p=10&k=76 [05.06.2021]; Rozporządzenie Ministra Środowiska z dnia 16 grudnia 2016 r. w sprawie ochrony gatunkowej zwierząt, Dz. U. z 2016 r., poz. 2183; Rozporządzenie Ministra Środowiska z dnia 9 lipca 2004 r. w sprawie gatunków dziko występujących roślin objętych ochroną, Dz. U. z 2004 r., nr 168, poz. 1764; Rozporządzenie Ministra Środowiska z dnia 9 lipca 2004 r. w sprawie gatunków dziko występujących grzybów objętych ochroną, Dz. U. z 2004 r., nr 168, poz. 1765.

Polish vascular plants species are found here. There is a big concentration of spruce and pine, called 'Supraska pine'.

- Łomża Landscape Park – located in the valley of the River Narew. There are numerous old riverbeds, river curves, peat bogs and wetlands. The region is rich in picturesque hills.
- Suwałki Landscape Park – is the first Polish park of this type. It is situated on the Suwałki Lake District and its distinctive feature is a postglacial landscape. There are several dozens of lakes within its territory, with the deepest lake in Poland, Lake Hańcza (108,5 m)[3].

In the Podlaskie Voivodeship there are two towns having the status of a health resort. These are Augustów and Supraśl, well-known voivodeship centers of recreation and resting. Augustów attracts thanks to the proximity of lakes of Augustów – Suwałki Lake District, and Supraśl attracts to forests of the Knyszyn Primeval Forest. Consequently, both centers offer many forms of recreation, especially active one. A rich offer of trips and sightseeing events also awaits tourists.

Key determinants of natural values occurring within the region of the Podlaskie Voivodeshipare: clean air, water, soil, flora and fauna richness. According to the inhabitants of the Podlaskie Voivodeship clean natural environment is unquestionable 'number one' out of the values of the region. Only then they mention a great number of wooded areas, good landscape values, biodiversity, national and landscape parks, and natural reserves as well as such as the River Biebrza, or the RiverNarew[4].

Anthropological values are of particular attention, because they are often considered in connection with natural values, by the eye of a tourist interested in recreation or improving health. Another significant factor is that the inhabitants of the Podlaskie Voivodeship value most healthy food, followed by low population density, multiculturalism and multinationality, arising from the region localization by the border[5].

The views of the inhabitants are reflected in the specialised official documents by public administrative bodies. In particular, reference can be made to the issue of clean air. In accordance with the Chief Inspector of Environmental Protection's report for 2019 the leading sources of emission to air were CHP plants, transport and waste burning (municipal sector). The standards of air pollution were exceeded only in some spots, narrowed down to urban areas, in particular in Łomża and

[3] K. Michałowski, B. Pleskowicz, *Przyrodnicze i etniczno-kulturowe uwarunkowania rozwoju potencjału turystycznego województwa podlaskiego*, „Zeszyty Naukowe Uniwersytetu Szczecińskiego" 2010, no. 590, pp. 160-166, http://zpppn.pl/parki-narodowe.
[4] A. Szczepanowski, *Walory turystyczne województwa podlaskiego potencjałem rozwojowym regionu*, „Zeszyty Naukowe Uniwersytetu Szczecińskiego" 2010, op. cit., p. 422.
[5] Ibidem, p. 423.

Białystok, in terms of single indicators. In general, the area of the Podlaskie Voivodeship is considered to be human friendly and safe, taking into account the quality of the air[6].

Due to the values of natural environment the Podlaskie Voivodeship region provides decent living conditions, and visitors leisure and recreation. In recent years, the statistics show the advantage of domestic tourists (about 1,55 mln) over foreign tourists (about 1,05 mln) visiting this voivodeship[7]. The aim of their visit in the region has changed over the recent years. Speaking about domestic tourists, there are fewer visits (decrease from 67,2% to 61,9%), and more cases of tourists looking for leisure and recreation, or places to spend holidays (increase from 24,8% to 29,1%) and cases concerning health improvement (increase from 1,6% to 2,1%)[8]. There are also fewer visits among foreign tourists (decrease from 34,8% to 27,1%), definitely there are more cases of tourists looking for leisure and recreation (increase from 4,2% to 15,2%) and tourists for shopping (increase from 34,5% do 29%)[9]. Moreover, research confirms the highest intensity of tourism flows in the region in those counties, in which flagship nature attractions are located (national parks, landscape parks, resorts)[10]. However, it is indicated that touristic potential has not been fully used, especially in the area of the nearby counties[11].

Pros and cons of the implementation of new digital technologies

The ultimate target of the ongoing process of digitization is to create the Internet of Things – IoT. It is supposed to be the network of many (billions) devices, which can „store, process or exchange data directly with each other or via an intelligent electrical installation or a computer network (eg. fibre-optic or wireless). In other words, IoT is a solution in which devices communicate with each other permanently”[12].

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[6] K. Cybulska, K. Barańska, P. Kowalski, W. Ciurzak, *Roczna ocena jakości powietrza w województwie podlaskim. Raport wojewódzki za rok 2019*, Regionalny Wydział Monitoringu Środowiska w Białymstoku, Departament Monitoringu Środowiska, Białystok 2020.

[7] G. Ślusarz, M. Cierpiał-Wolan, B. Gierczak-Korzeniowska, J. Uchman, P. Żegleń, *Potencjał turystyczny i jego wykorzystanie w latach 2014-2018 – ujęcie regionalne*, op. cit., p. 86.

[8] Ibidem, p. 87.

[9] Ibidem, p. 88.

[10] K. Parzych, *Uwarunkowania i ocena potencjału turystycznego województwa podlaskiego*, „Zeszyty Naukowe Uniwersytetu Szczecińskiego” 2010, op. cit., p. 179.

[11] Ibidem, p. 177, 180.

[12] P. Bieńkowski, M. Zmyślony, J. Karpowicz, P. Politański, A. Bortkiewicz, J. Kieliszek, K. Rydzyński, *Uwarunkowania ekspozycji ludności na pole elektromagnetyczne zwią-*

The pillar of IoT is supposed to be the network (standard) 5G. It should be noted that 5G, just like 2G, 3G, 4G, 4,5G, are just waves, only that these ones are one millimeter long. It means they have very short length, but very high frequency (from 6-15 GHz to 300 GHz).

A possibility to download and to transfer one gigabit of data per second is an undeniable advantage of the standard 5G, but the only one. It is estimated that due to this advantage most of the traffic in the network 5G will be connected with downloading, transferring and playback of movies, or online transmissions in high resolution (4K and 8K). Consequently, it will be used in entertainment and showbusiness[13]. Recently, the questions arise about the safety of data transfer, the costs of the enterprise, and what should be the most important – the health and environmental (biological) consequences. There will be ones who will raise the issue of landscape deforming and fall in real estate value. In this regard these are not positive solutions, but some evidence indicates its drawbacks.

The costs of implementation and usage, health consequences are mentioned among the biggest disadvantages of the network 5G. Recently, both aspects have been raised more and more often by scientists and specialists. Though, there is no in-depth research, which is officially called for, we know more and more about the effects of using new technologies. Moreover, the European Parliament referred to them for the first time in February, 2020 by the issuance of briefing[14].

Let's start with economic costs. Setting up the 5G network itself, only within all urban areas until 2025, has been valued by the European Council at around 500 billion euro[15].On the one hand, these devices will be of a new generation. On the other hand, their density will be giant. So, the number of base stations will be large. Some stations will be located within the distance of a few hundred, several dozens, and even a dozen or so meters apart from each other. Antenna telecommunications equipment will be expensive and not susceptible to modernization, what leaves only room for an exchange. The equipment of an end-user (eg. a smart phone, a tablet) adjusted to the 5G network, is also expensive. As well as the usage. It is indicated that a 5G base station needs three times more energy than a 4G station. It also relates to devices of end-users. Their devices will use the OFDM encoding method, that is why they will

zane z użytkowaniem radiokomunikacyjnych sieci w technologii 5G w Polsce, „Medycyna Pracy" 2020, no. 2, p. 246.

[13] Ibidem, p. 247. See: https://instytutsprawobywatelskich.pl/megaustawa-5g-czy-taksiega-rzeczywiscie-jest-biala-cz-1/ [05.06.2021].

[14] https://www.europarl.europa.eu/thinktank/pl/document.html?reference=EPRS_BRI(2020)646172 [05.06.2021].

[15] Ibidem.

be able to accommodate a large amount of energy at one time. As a result, batteries of such devices, such as smart phones, will use up much faster[16].

The most serious reservations concern an influence of the 5G network on a human. It needs to be said that nowadays a human body is exposed to an influence of electromagnetic fields from many sources. These are: wireless computer networks (Wi-Fi), short-range wireless communication (Bluetooth), smart phones, antenna masts, television sets, computers, smart meters, microwave ovens, transformers, overhead high-voltage power lines, radars, military scientific installations[17].

Let us remind that the density of antennas will be large and there will be four types of them:

1) macrocells – to serve customers who are inside and outside buildings (frequency to 1 GHz);

2) outdoor micro cells – to serve areas with a high density of mobile customers (eg. squares, pavements, streets– because of walkers, cyclists, vehicle passengers; (a frequency range from 1 to 6 GHz);

3) picocells – local points available with a range of several – several dozens of meters to serve customers in locals, at the stadiums, in parks (a frequency range above 30 GHz);

4) femtocells – intrabuilding access points to serve single offices, business premises, stations etc. (a frequency range above 30 GHz)[18].

Besides, energy „will be directed only to one specified user, and the antenna beam will 'follow' this user[19]. Due to that fact every person within their range, especially local inhabitants, will be exposed to the radiationof millimeter waves"[20]. As the European Parliament officially recognizes „nobody will be able to avoid being exposed to permanent electromagnetic radiation"[21].

Energy will be received by end-users in the form of a high power and high frequency impulse. Due to the nature of waves they will stop on a human's body, however, some authors (prof. Annie Sasco from Italy) claim that they will penetrate into the skin up to 10 mm of the depth, causing not only local impacts (on skin cells, nerve endings, microcircu-

[16] http://stop5g.com.pl/5g-prawdziwy-wampir-energetyczny/.
[17] W. Podgórski, *Promieniowanie elektromagnetyczne (PEM)*, „Kwartalnik Budowlany" 2017, no. 3, [wkładka techniczna].
[18] P. Bieńkowski, M. Zmyślony, J. Karpowicz, P. Politański, A. Bortkiewicz, J. Kieliszek, K. Rydzyński, op. cit., p. 247.
[19] Ibidem, p. 248.
[20] *Skutki bezprzewodowej łączności 5G dla zdrowia ludzkiego*, p. 4, https://www.europarl.europa.eu/thinktank/pl/document.html?reference=EPRS_BRI(2020)646172 [01.07.2021].
[21] Ibidem, p. 7.

lation), but also on the entire system leading to the release of inflammatory substances"[22]. In the briefing the European Parliament claims that "pulsed electromagnetic fields are usually more biologically active, consequently more dangerous than non-impulse electromagnetic fields"[23].

There is no complex research in the area of electromagnetic fields of high frequency. Nevertheless, there is more and more evidence of biological properties of electromagnetic fields of radio frequencies. Although, some pieces of available evidence are controversial or only in the preliminary phase of research, they point out that electromagnetic fields of high frequency enter into multi-level interactions with biological systems, what may result in oncological and non-oncological effects (mainly reproductive, metabolic, neurological and microbiological)[24]. Polish scientists draw attention to the fact, that target organs of the influence of waves exceeding the 6 GHz frequency, will be skin and eyes due to the low depth of penetration[25].

They refer to the valuable research outcomes of Scientific Committee on Emerging and Newly Identified Health Risks of 2015[26], from which it is officially evident that exposure to frequencies from 700 MHz to 6 GHz:

1) may have effects on brain activity during wakefulness and sleep;

2) show a possibility of increased risk gliomastoma and acoustic neuroma occurring, following an intensive use of a mobile phone;

3) in some cases it causes DNA breakage[27].

Moreover, acting under the auspices of the WHO International Agency for research on Cancer included electromagnetic fields with radio frequencies into factors presumably carcinogenic to humans, together with eg. lead (group 2B)[28]. Certainly, one cannot be selective in relation to the 5G network. It is vital to notice that electromagnetic fields of the sources, which have been known so far, may also have a negative influence on human health, potentially from slight ailments (eg. headaches, memory loss) up to carcinogenic[29]. Today, people are saying more

[22] https://www.ilfattoquotidiano.it/.

[23] *Skutki bezprzewodowej łączności 5G dla zdrowia ludzkiego*, p. 7, https://www.europarl.europa.eu/thinktank/pl/document.html?reference=EPRS_BRI(2020)646172 [01.07.2021].

[24] Ibidem, p. 8.

[25] M. Zmyślony, P. Bieńkowski, A. Bortkieweicz, J. Karpowicz, J. Kieliszek, P. Politański, K. Rydzyński, *Ochrona zdrowia ludności przed zagrożeniami elektromagnetycznymi – wyzwania wynikające z planowanego w Polsce wdrożenia systemu radiokomunikacji standardu 5G*, „Medycyna Pracy" 2020, no. 1, p. 108.

[26] Ibidem.

[27] Ibidem

[28] https://monographs.iarc.fr/list-of-classifications.

[29] See: W. Podgórski, op. cit.; https://www.youtube.com/watch?v=sLUXm3_tpT8.

and more about the syndrome of electrosensitivity (EHS) that is manifested by among others: troubles with memory and concentration, chronic fatigue, cardiac arrhythmias or disorders of digestive system[30].

It is not only about man who is just one element of living nature. The landscape filled with telecommunications installations and their functioning will definitely have impact on the entire ecosystem – flora and fauna. An electromagnetic field, being an artificial creation of man, is alien to nature. Therefore, questions arise about the effects of the impact of new and subsequent type of an electromagnetic field on the rest of living organisms. It seems that due to the nature of the impact of high frequency waves and the structure of the antenna network primarily exposed organisms to their activities will be birds and insects (eg. as naturally valuable as bees). There is also a wide area of research which is a kind of challenge.

In the context of many doubts, the issue of fiber optic technology is growing in importance[31].The European Parliament seems to see this, claiming in the briefing: "Some experts claim that fiber optic technology is a safe alternative to 5G, because the signal is limited only to the optical fiber. The potential of this technology is much bigger than in the case of 5G and there is no comparison between optical fiber and wireless technology. As far as investment in optic fibers is concerned, modernization is possible in the future, resulting in greater speed. Whereas, in the case of wireless technology it would be necessary to change the entire system"[32].Certainly, optical fiber technology mis suitable for stationary use, however, its advantages are unrivaled here in relation to other solutions. It is environmental security and information transfer, the biggest potential[33], a possibility of modernization, high efficiency and low energy consumption.

It needs to be mentioned that in view of the ubiquity of electromagnetic fields, some countries are striving to limit their negative effects, especially health ones. Since 2015, Wi-Fi and wireless technologies have been banned in France in rooms intended for housing, rest and

[30] https://instytutsprawobywatelskich.pl/megaustawa-5g-czy-ta-ksiega-rzeczywiscie-jest-biala-cz-2/.

[31] As of September 2019, 6.5% of Internet customers in Poland were using FTT technology. This compares to 65.9% in Iceland and 62.8% in Belarus over the same period, https://www.telepolis.pl/wiadomosci/prawo-finanse-statystyki/swiatlowod-polska-europa-092019 [12.07.2021].

[32] *Skutki bezprzewodowej łączności 5G dla zdrowia ludzkiego*, p. 10, https://www.europarl.europa.eu/thinktank/pl/document.html?reference=EPRS_BRI(2020)646172 [10.07.2021].

[33] A data transfer record of 44 TB/s has already been achieved with this technology. See: https://www.benchmark.pl/aktualnosci/swiatlowodowy-rekord-predkosci-internetu-44-tb-s.html [11.07.2021].

activity of children under 3 years old. In schools for children under 11 years old, the use of Wi-Fi is minimized only for educational purposes. Otherwise, they are to be switched off. Similar regulations are in Israel, where wireless installations can be usedin schools up to a certain number of hours per week. A teacher is to use the Internet connected via cable[34]. Due to the doubts which are indicated here, Slovenia postponed the implementation of the 5G standard on the 24th of January, 2020[35].

Changes in telecommunications, local government and environmental protection law on the canva of digitalization

In the European Digital Agenda for 2010 Member States, and therefore Poland, were obliged to provide all citizens access to the Internet at a speed at least 30 Mb/s and to bring access to services at a speed at least 100 Mb/s by 50% of households by 2020. In addition, new European targets impose on Member States an obligation to provide by 2025, among others:

- gigabit access to the Internet for all the places which are the main driving force of socio-economic development (eg. schools, transport hubs, places of providing public services) and entrepreneurs conducting intensive activities on the Internet;
- uninterrupted access to the 5G network to all urban areas and the main communication routes, – access to the Internet at a speed at least 100 Mb/s (with the possibility to increase it to gigabit speeds) to all households;
- to have a 5G network developed by 2020 in at least one city of a Member State[36].

In turn, the European Council in its resolution No.1815 (2011)[37], expressed concern about the problem of using very low frequency electromagnetic fields due to potential health effects. It was indicated that some non-ionising frequencies have potentially harmful non-thermal (biological) effect on humans, animals, plants, even in the case of exposure to levels below the official limit values. The resolution draws attention to very high socio-economic costs. It recommends carrying out protective, information and research activities in the field of exposure to

[34] W. Podgórski, op. cit., p. 15.
[35] http://stop5g.com.pl/slowenia-odroczyla-wdrozenie-5g/.
[36] *Strategia na rzecz odpowiedzialnego rozwoju do 2020 (z perspektywą do 2030 r.)*, Departament Strategii Rozwoju Ministerstwa Rozwoju, Warsaw 2017, p. 295.
[37] https://assembly.coe.int/nw/xml/XRef/Xref-XML2HTML-en.asp?fileid=17994.

electromagnetic fields. One of these recommendations is using alternative, i.e. wired internet connections.

Polish response to the requirements of the European Digital Agenda is the National Broadband Plan, which was drawn up in the Ministry of Development, currently in force as the updated version from 2020[38]. In no way does the plan refer to the LTE-Advanced technology or optic fiber technology. One can get an impression that it is entirely dedicated to the 5G standard. Its objectives are to eliminate administrative and legal barriers in investment processes, to reduce the costs of building telecommunications infrastructure, to build a friendly environment for telecommunications infrastructure, to create a legal basis to implement modern telecommunications techniques (5G). It is confirmed by the changes recently introduced in law, which are the main effect of adopting the act of the 30th of August, 2019 on amending the act on supporting the development of telecommunications services and networks and some other acts[39].

In the first place, references should be made to the amendment of the act of the 7th of May, 2010 on supporting the development of telecommunications services and networks[40]. A new paragraph 1a was inserted in the Article 3, according to which an activity of building telecommunications infrastructure and telecommunications networks can be undertaken if in the given area:

1) there is no infrastructure and telecommunications networks;

2) the existing infrastructure and telecommunications networks are not available or do not meet the needs of the local government unit. The inserted provision applies to the areas previously free from electromagnetic fields (non-urban), opening up the possibility to penetrate them by telecommunications entities. It can be concluded that this is to facilitate the expansion of the 5G network, particularly due to the planned enormous density of base stations throughout the country. A new Article 3a gives executives bodies of local government units the right to grant subsidies to private entities from the budget of a local government unit to finance the investment costs related to satisfying the needs of these entities in terms of access to a fast telecommunications network at the end-user's location.Therefore, it will be public money of the local government community, which will be irrevocably allocated to commercial entities on their activities.

[38] https://www.gov.pl/web/cyfryzacja/narodowy-plan-szerokopasmowy---zaktua lizowany.

[39] Journal of Laws 2020, item 695.

[40] Journal of Laws 2020, item 471 and 695, consolidated text.

The new article 16a establishes the Broadband Fund. Money from this fund is to be allocated to:

1) activities supporting the development of fast telecommunications networks by subsidizing or granting loans for building or reconstruction of these networks and making telecommunications connections to the end-user's location.

2) activities aimed at stimulating the demand of end-users for services related to the broadband Internet access by subsidizing the purchase of telecommunications services, the purchase of multimedia devices and the organization of trainings developing digital competences or participation in these trainings.

So, the fund will pay for investment and propaganda activities. This is another normalization of that type of activities, but their direct beneficiary will be commercial entities. Previously in force, the Article 15 gave the possibility to local government units to carry out activities in order to stimulate and to aggregate the users' demand for services related to broadband Internet access, educational and training, by equipping the consumers with telecommunications terminal equipment, computer hardware or financing the consumers' costs of telecommunications services.

Anyway, the Article 46 paragraph 1 of the act in question, previously in force, has be to assessed negatively. According to its content the local plan of spatial development cannot impose bans, and the solutions adopted in it cannot prevent from localizing public purpose investments in the field of public communications. Whereas, the paragraph 3 of this Article states that zoning an area for multi-family housing, single-family housing, agricultural, forestry and service purposes does not prevent a telecommunication investment location. This appears as a central exclusion of competences of local governments in the field of spatial development.

Introducing the Information System on Installations Generating Electromagnetic Radiation is not less positive aspect of the amendment of the 30th of August, 2019. The system is to contain the information about:

1) the levels of electromagnetic field coming from measurements and research (conducted by the Inspection of Environmental Protection);

2) the locations of radiocommunications investments used for the purposes of the mobile public telecommunications networks, excluding the information about critical infrastructure;

3) the distribution of the strength of electromagnetic field coming from the above-mentioned installations;

4) coming from radio licenses;

5) coming from the registry of radio devices used without permission;

6) notifications of installations from which emissions do not require a permit, but which may have a negative impact on the environment. The system is still being built.

The amendment did not bypass the acts of local governments. Accordingly – a borough[41], county[42] and voivodeship[43] – gained the possibility to conclude a contract with an investor, whereby, in exchange for the investment satisfying the collective needs of community, connected with the occupation of a road lane by an investor in order to place on the road lane the devices of technical infrastructure unrelated to the needs of road management or the needs of traffic, shall set the fee rate for the occupation of the road lane in a lower amount than set in the resolution adopted on the basis of the Article 40 par. 8 of the act of the 21st of March, 1985 on public roads. Undoubtedly, such an investment may be a construction of a base station of the 5G network. The regulation itself establishes a transaction type "investment in exchange for investor preferences".

Just like in the case of the above-mentioned Information System – it was a necessity and result of the designed solutions, the changes in the Article 122a par. 1 of the act of the 27th of April, 2001 need to be assessed positively – Environment Protection Law[44]. It was found that the measurements of an electrical field in the environment are to be made directly before an installation or a device is used, and whenever there is a change in the existing development and real estate development, resulting in changes in the presence of locations accessible to people in the vicinity of an installation or a device (not ex officio, but upon the written request of an owner or a property manager, on which the change occurred). Adding the paragraph 1a to this Article has to be assessed negatively. It is a gateway to avoid taking measurements of electromagnetic field, as long as the last measurements did not show that permissible electromagnetic field levels were exceeded in the areas covered by the application. Applying the methodology based on a good will of telecommunications entities, commercial measurements may only be taken once, when the investment is commissioned. I assess similarly adding the paragraph 4b to the Article 152 of this act. Pursuant to this regulation the environmental

[41] Article 50a of the Act of 8 March 1990 on Municipal Self-Government, Journal of Laws of 2020, item 713, consolidated text.

[42] Article 50a of the Act of 5 June 1998 on county government, Journal of Laws of 2019, item 511 and 1571, consolidated text.

[43] Art. 59a ustawy z dnia 5 czerwca 1998 r. o samorządzie województwa, Dz. U. z 2019 r., poz. 512, 1571, 1815, tekst jednolity.

[44] Dz. U. z 2020 r., poz. 695, tekst jednolity.

protection authority competent to accept the installation notification, from which the emission does not require a permit, but can have a negative impact on the environment, can, ex officio, before the expiration of the 30-day period from the installation construction to its operation, issue a certificate stating that there are no grounds to object. So, the authority is deprived of the option to object and a telecommunications entity can start using the installation. The deadline for objection is quite short, it is not clear why preferences to investors may be applied here.

Preferences are also inserted into the act of the 16th of July, 2004 the Telecommunications Law[45], thanks to the article 139a. Well, if the President of OEC [*the Office of Electronic Communications*] considers that the coverage of the country territory with a range of mobile telecommunications networks is not sufficient, he may conclude an investment contract with a telecommunications entrepreneur, under which in exchange of lower telecommunications fees, this entrepreneur will implement the investment by ensuring that the area indicated by the President of OEC will be covered with a range of mobile telecommunications networks, where the coverage is not sufficient. This is another example of a transaction of the type: "investment in exchange for investor preferences".

According to the amended Article 39b of the act of the 28th of September, 1991 on forests[46], firstly, a forester was obliged to specify the conditions for providing access to telecommunications entities and placing telecommunications objects and devices on forest estates. Secondly, the forester was obliged to conclude contracts, related to the abovementioned access, with telecommunications entities and contracts related to placing telecommunications objects and devices on forest estates. This could be seen as a 'central' introduction of digital technologies, especially 5G, into forest areas.

What in incomprehensible is that the legislator also included into legislative activity areas with special natural values protected by law, it means national parks and nature reserves. The amendment of the Article 15 par. 3 (2) and par. 4 (2) of the act of the 16th of April, 2004 on nature protection[47] repeals bans in force in national parks and nature reserves for the purpose of implementation of public purpose line investments or for the purpose of implementation of public purpose investments in the field of non-linear public communications in order to provide telecommunications in the area of national park and nature reserve (in the case there are no alternative solutions and after nature compensation is guar-

[45] Journal of Laws of 2020, item 374 and 695, consolidated text.
[46] Journal of Laws of 2020, item 6 and 148, consolidated text.
[47] Journal of Laws of 2020, item 55 and 471, consolidated text.

anteed). This action may be compared to "the introduction" of digital technologies into national parks and nature reserves. This is all the more puzzling as natural "inhabitants" of these areas are animals and plants.

'Digital' changes affected also the act of the 28th of July, 2005 on health resort treatment, health resorts, health resort protection areas and health resort communes[48] (Art. 38a par. 1(1h) and par. 2(1b). The ban on construction of base stations of mobile telecommunication services, radio and television broadcasting stations, radiolocation and others emitting electromagnetic waves (excluding those ones for the purposes of public security and emergency services)in the zone 'A' of health resort protection was removed from the act.

We should add that the zone 'A' is characterised by the participation of green areas not less than 65% and the locating of devices and health resort medical services providers, as well as other objects used for health treatment or patient or tourist services, it means guest houses, restaurants and cafés (Art. 38 item 10). An analogous ban was removed from the zone 'B' of environmental protection. In this case it referred to devices emitting electromagnetic waves, the enterprises that can always have a significant impact on the environment, as well as effect on the zone 'A' of protection, with electromagnetic fields with levels higher than the acceptable levels of electromagnetic fields for places accessible to people. It should be added that in the zone 'B' green areas account for not less than 50%. These are the areas adjacent to the protection zone 'A'. They are intended for – service and tourist facilities (including hotels), recreational, sports and communal, housing construction and other ones connected with satisfying the needs of people staying in this area, which do not have a negative impact on healing properties of health resort or health resort protection areas and they are non-arduous to the patients. They can be within the boundaries of a national park or a nature reserve, be a forest, a sea or a lake.

The intentions of the Ministry of Development and the Ministry of Digitization are not manifested by the Ministry of Environment. It can be concluded because the Minister of Environment did not request for changing the regulations in the he Council of Ministers' Ordinance of the 10th of September, 2018 regarding the enterprises which may have a significant impact on the environment[49] in the field of installations emitting electromagnetic field. Because they maintained the regulations that in the frequencies from 0,03 MHz to 300 000 MHz radio communication, radio navigation and radiolocation installations with a specified power, located closer than a specified distance from the places accessible to

[48] Journal of Laws of 2020, item 284, consolidated text.
[49] Journal of Laws 2019, item 1839.

people, are classified in accordance with the parameters, either in the enterprises that can always have a significant impact on the environment (§2 par.1 item 7), or in the enterprises that can potentially have a significant impact on the environment (§3 par.1 item 8).

Finally, a very important issue. On the basis of the regulation of the Minister of Health of the 17th of December, 2019 on permissible levels of electromagnetic fields in the environments[50], the legal limits on the power density of electromagnetic fields were increased a hundredfold, because from 0,1 W/m² to 10 W/m², in the frequencies from 2 GHz to 300 GHz. These are the maximum values resulting from the recommendation of the Council No1999/519/EC of the 12th of July, 1999 on the limitation of exposure of the general public to electromagnetic fields (from 0 Hz to 300 GHz), arising from the guidance given by the International Commission on Non-Ionising Radiation Protection (ICNIRP). Thus, the recommended power density values date back to the late 20th century, moreover they refer to only to thermal effects of the impact, without any reference to the biological impact[51].

Conclusions

At first glance the issue of deepening digitalization seems to be distant, and in the common understanding it is oversimplified to modern, good-looking devices. Not many people may think that it is just a small part of the designed system of telecommunications and data transfer. When we go into details, we may start asking questions how new digital technologies change us and the environment we live in. These questions will also be faced by the inhabitants of the Podlaski Voivodeship, which has its own character and will be affected by new solutions, especially the 5G standard, in its own way.

The Podlaski Voivodeship constitutes a very important eastern part of 'The Green Lungs of Poland', without heavy industry, with a high proportion of forests, clean air, many national and landscape parks, rich flora and fauna, health resorts. The region is famous for harmonious coexistence between man and nature. This is a convenient place to live, relax and for recreation. Environmental and nature values are appreciated by inhabitants and tourists.

[50] Journal of Laws 2019, item 2448.

[51] M. Zmyślony, P. Bieńkowski, A. Bortkiewicz, J. Karpowicz, J. Kieliszek, P. Politański, K. Rydzyński, op. cit., p. 110. In China, one of the cradles of 5G, the sharpest values oscillate between 0.1 W/m2 and 0.4 W/m2. The biologically acceptable power density level, according to recent reports, oscillates around 100 nW/m2. See: W. Podgórski, op. cit., p. 3; p. 16.

However, in view of the intensive spread of the 5G technology, the values of the region may lose their importance. Areas of the Podlaski Voivodeship, so far free from the effects of strong electromagnetic fields, may converge to metropolitan areas in respect of electromagnetic environment. Statutorily, the 5G network, so commercial operators, gained unlimited access and the possibility to conduct an activity in valuable areas of nature, leisure, recreation and health – to forests, national and landscape parks, health resorts and areas adjacent to them. This happens despite the fact that there are so many doubts connected with the impact of new type of electromagnetic waves on human health and natural environment. It is not mostly about so mundane issues like landscape deformation, though having their importance, or the decrease in the value of real estate near base stations. If the whole country is to be tightly covered with base stations, regardless of the obvious natural values, one has to reckon with the decrease in ecological, resting, recreational and tourism potential of the Podlaski Voivodeship. Protection zones and health resorts are not established to introduce there, the solutions which are alien to nature. Nevertheless, the rest of the areas, which are not covered with legal protection, including clusters of people, should also have the right to be free from the pollution of electromagnetic fields.

At the same time, such significant issues are resolved without the will of local governments. By the way of statute, the competences of local governments to shape spatial order as a part of spatial planning are limited. Local governments have been deprived of the influence whether telecommunication installations are to be built in the given unit, and if so, where, in what quantity and in what density. This is thought – provoking, because local governments have instruments to fight against smog, but they do not have any, in the case of "electrosmog". Commercial electro communication entities enjoy full freedom of investment locating and numerous preferences.

Minimizing the environmental and health effects for the voivodeship would bring a wider introduction of fiber optic technology. Cheap technology and easy to modernize, safe for health and the environment. The LTE-Advanced technology, which can be compared with 5G, has not been fully developed. By 2025 the 5G network is to be developed by the main communication arteries for the time being. Were it not for the 'central' provisions, one could adopt a cautious attitude at that time and not implement it in the voivodeship over this range. Because it is very difficult to compensate for health and environmental damage. The north-eastern region of Poland is famous for its assets, which are a refuge for inhabitants and constitute a destination for tourists. It is worth keeping it that way.

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PHOTOVOLTAIC PANEL RECYCLING AS THE PROBLEM AND THE FUTURE OF PODLASKIE PROVINCE

Introduction

Since some time, all over the world, but also in Poland, renewable energy sources have gained a major importance. At the beginning, due to not fully developed technology of producing solar power, a leading role played wind plants (first with a horizontal and then with a vertical axis turn). As a solar power technology developed, photovoltaic panels became more available (mainly because of acceptable prices and the improved efficiency of modules). Nowadays, solar modules are installed on agriculture lands (as a source of energy for sale) as well as on residential buildings (to cover energy needs of individual households). In developed countries, photovoltaic plants have been used for over 20 years and their life cycle is inevitably reaching its end (as a result of decrease in their efficiency, but also because of their backwardness in comparison to devices of a similar kind). Owners of these facilities have to face the problem of disused solar panels and what to do with them. First solar panels waste plants are already being established all over the world to recycle waste solar panel materials, but the process itself is very expensive. For the time being, in Poland there aren't any facilities able to recycle photovoltaic cells. As a result, mainly in north-eastern Poland (where the demand for photovoltaic plants is very visible), there is a need to have a closer look at the issue of solar panel recycling. Although the problem is not observed within the boundaries of Podlaskie province now, it will become a major issue in the years to come.

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Legal considerations concerning Renewable Energy Sources (RES)

Among the major priorities set by The European Union for its members, the one is to increase the role of RES in the overall energy output. The first document to outline the general guidance for renewable energy power sector was so called White Paper[1] entitled "Energy for the Future. Renewable Energy Sources" adopted by the EU Commission in 1997. Following the rules set in this document, entities receive financial aid to develop RES (in the form of direct financial aid, guarantee of purchase and tax reliefs), but the renewable energy share in an overall country's energy output was supposed to increase from 6% in 1995 to 12% in 2010. Published in 2000 so called Green Paper[2], planned to double the share of RES in an overall member states energy production. In the second half of 2001 the European Parliament and the EU Council adopted Directive 2001/77EC[3], which planned that till 2010 RES should constitute 12% of an overall energy output and 22,1% of electrical energy. This was supposed to be verified by the means of reports submitted by the member states every 5 years. The key assumptions of the energy policy of the EU member states were presented in the climate and energy package in 2007. This document indicates the need to limit the emission of greenhouse gases by 20% and the need to increase RES's share in an overall energy output to 20%.

First regulations concerning RES appeared in Poland in an Energy Law[4], which obliged energy companies to purchase electric energy produced by non-conventional power plants. Whereas in "The National Energy Action Plan for Poland till 2020" non-conventional energy share was established at the level from 5,1% to 5,7% of domestic primary energy consumption. In response to EU changes in energy policy, Poland had to verify its projections concerning the use of RES and in August 2001 Polish Parliament adopted "Strategy for Development of Renewable Power Sector". This document set that the share of RSE in domestic use of primary energy will reach 7,5% in 2010 and 14% in 2020.

In 2005 an amendment to Energy Law was published which introduced certificates for obtaining energy from renewable sources, so called "green certificates". Also the sum of advance payments made by inves-

[1] White Paper, Energy for the Future: Renewable Energy Sources, EU Commission, Brussels, 27 November 1997.
[2] Green Paper – Towards a European strategy for the security of energy supply, EU Commission, Brussels, 29 November 2000.
[3] Directive 2001/77/EC. Directive on the promotion of electricity produced from renewable energy sources in the internal electricity market, Brussels, 27 November 2001.
[4] *Energy Law*, Polish Journal of Laws 1997, item 54(348).

tors to connect RSE to a power grid was defined as well as energy quality parameters which energy has to fulfil.

At the end of 2009 the Government adopted "Energy Policy for Poland till 2030", where the primary aims for domestic energy policy were presented. Among others, the following matters were included:

- development of renewable energy sources,
- improvement of energy transmission,
- diversification of energy sources by implementation of nuclear power,
- energy influence limitation on a natural environment.

To meet the goals listed above new legal regulations, tax reliefs and exemptions as well as public funds support were introduced.

In 2015 Poland was obliged by the European Union to increase the use of renewable energy till 2020 by 15% gross consumption. Five years earlier first actions were undertaken to create law on renewable energy sources, which finally resulted in adopting appropriate regulations in 2015[5]. This act of law specifies among others:

- conditions for fulfilling domestic action plan for RES,
- conditions for international cooperation in the era of RES,
- rules and conditions for generating electric energy from RES,
- procedures and tools for supporting renewable energy production,
- rules for issuing energy origin guarantees.

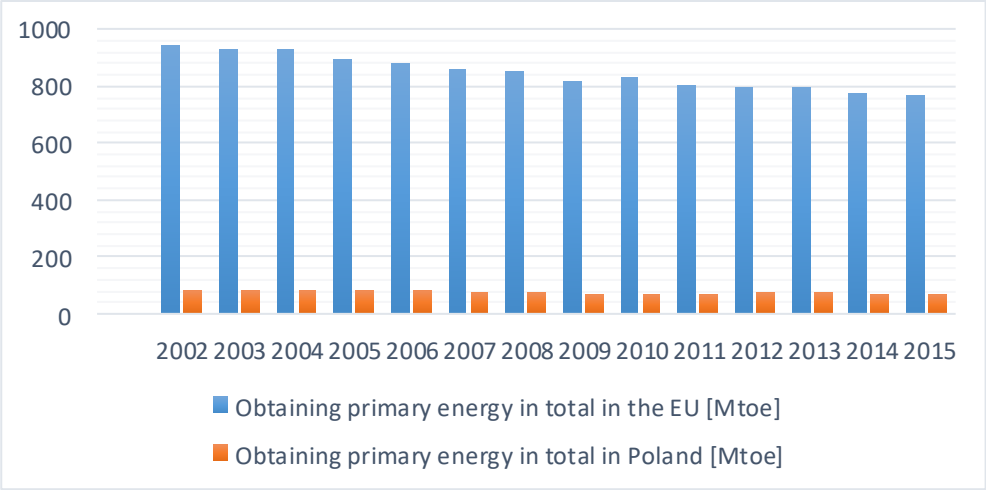
The share of renewable energy sources in the production of energy in Poland and in the EU countries

According to information provided by the Central Statistical Office, the amount of energy production within the past few years in EU countries and in Poland has been slightly decreasing (year-on year) – (Figure 1). It can be also observed that the share of renewable energy sources in primary energy in general is growing rapidly (Figure 2).

The share of particular kinds of renewable energy sources in different regions in Poland depends primarily on geographical conditions and possibility to use particular resources. When the development of domestic renewable energy sources was in its early stage, most popular were wind plants. However, in 2016 so called wind mill act was adopted, which halted the development of this energy branch. In 2017, in Poland renewable energy comes from biofuels (67,9%), wind power (14,0%) and liquid biofuels (10,0 %) – Figure 3.

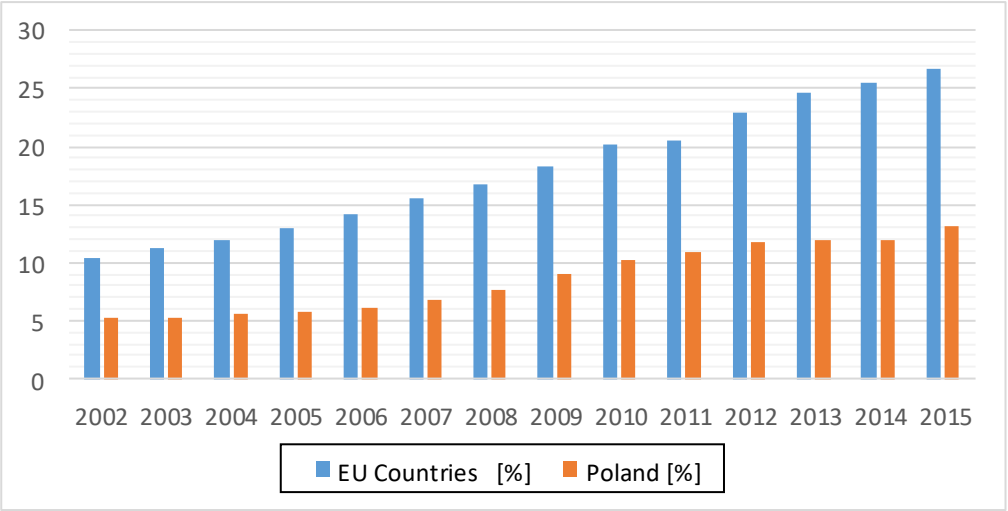
[5] *Renewable Energy Sources Law*, Polish Journal of Laws 2015, item 478.

Figure 1. Obtaining primary energy in the EU countries and in Poland in years 2002-2015



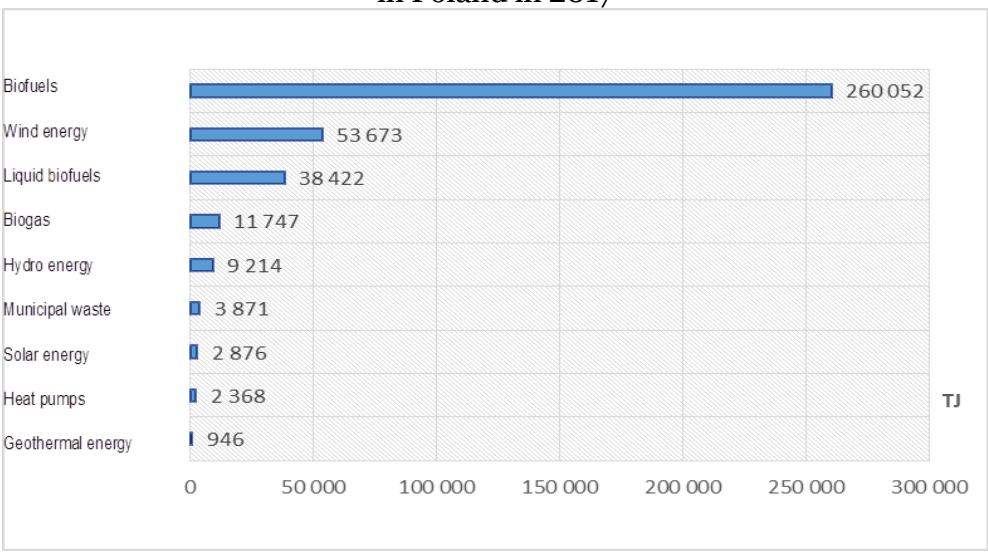
Source: The Central Statistical Office, *Energy from renewable energy sources in 2012 and 2016*.

Figure 2. Percentage of energy from renewable energy sources in primary energy in general in the EU countries and in Poland in years 2002-2015



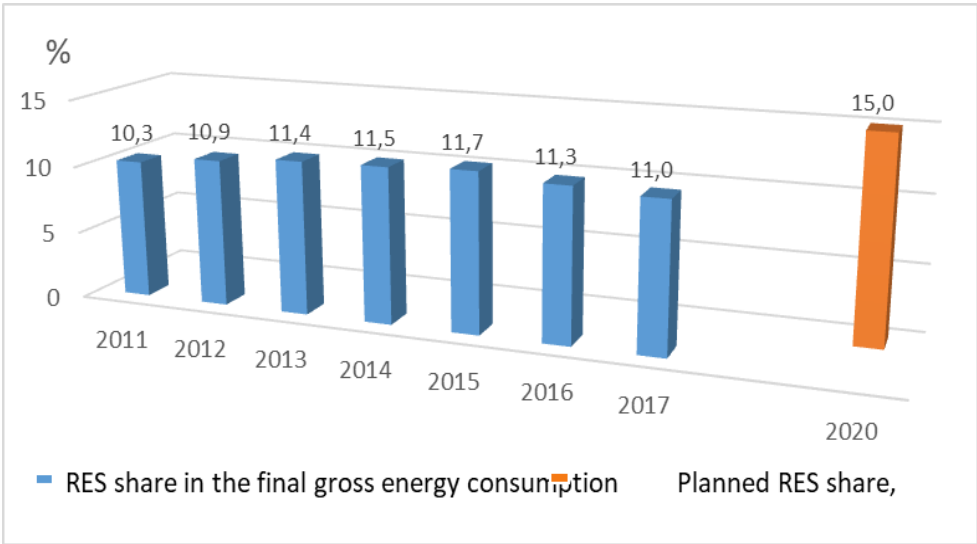
Source: The Central Statistical Office, *Energy from renewable energy sources in 2012 and 2016*.

Figure 3. Share of particular kinds of renewable energy sources in Poland in 2017



Source: The Central Statistical Office, *Energy from renewable energy sources in 2017*.

Figure 4. Percentage of renewable energy sources in the final energy consumption in Poland



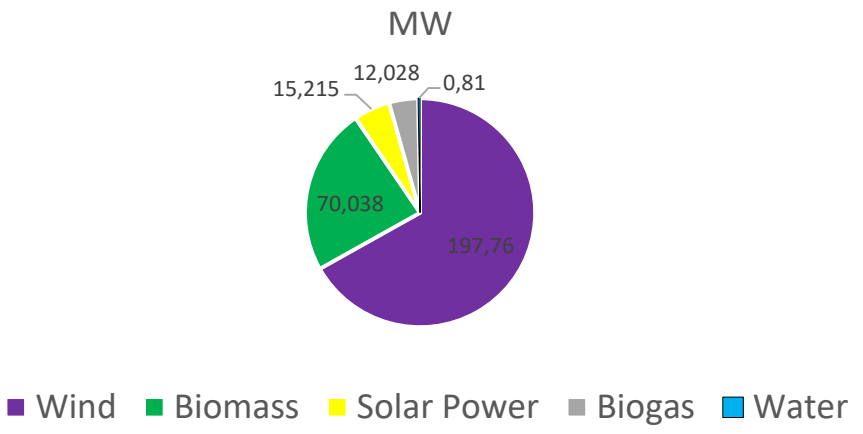
Source: The Central Statistical Office, *Energy from renewable energy sources in 2017*.

According to the regulations described before, Poland was obliged to reach 15% RES share in general energy production. However, despite RES share growth in 2015, it fell in 2017 (mainly as a result of growth by about 6,5% in gross energy consumption) by 0,32% in comparison to 2016 (Figure 4).

The share of renewable energy sources in Podlaskie province

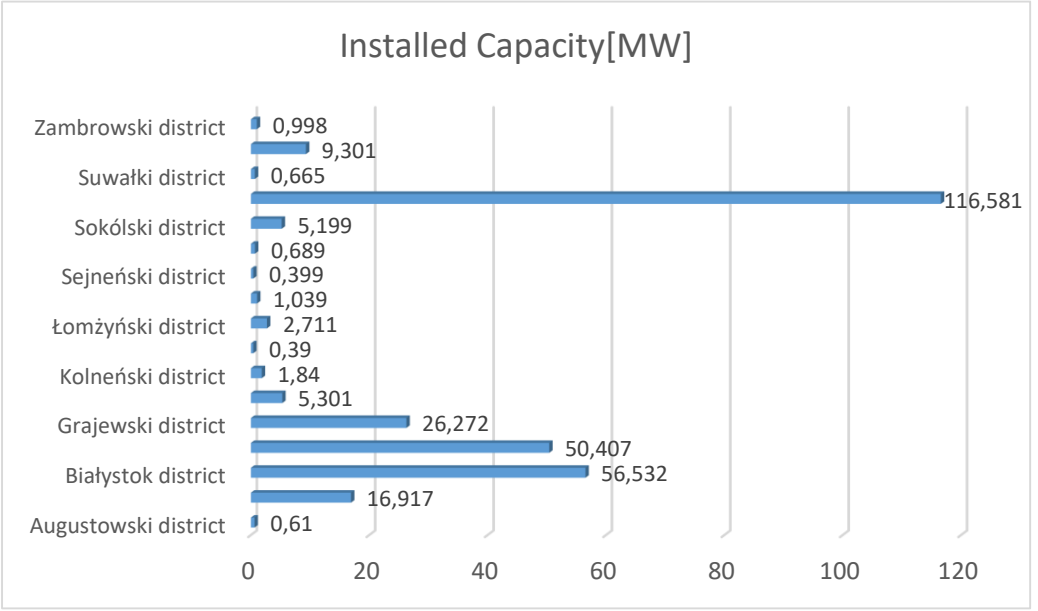
The accessibility of varied energy kinds in different regions of Podlaskie province largely depends on geographical location (for example the strongest wind power can be observed in the northern parts of Suwalszczyzna region) and agricultural use of soils (areas with better quality soils can generate more biomass of agricultural origin and wood areas more biomass from trees). In Podlaskie province wind power energy production plays a leading role (Figure 5). The least developed is water energy production due to not many natural water accumulations in this region. Among local administrative units, most renewable energy is obtained in Suwalski district (Figure 6), which is a result of many wind plants installed in this region. When compared to urban areas in terms of source powers installed, rural areas perform much better (due to the presence of areas where large production units can be found). Among large cities in Podlaskie province, Bialystok is playing a leading role with over 50 times more energy sources than in Łomża and Suwałki together.

Figure 5. Installed capacity in particular kinds of renewable energy sources in Podlaskie province as at 31 March 2019



Source: The Marshal's Office of Podlaskie province.

Figure 6. Renewable energy sources installed capacity in individual districts in Podlaskie province as at 31 March 2019



Source: The Marshal's Office of Podlaskie province.

The variety and diverse location of renewable energy sources in particular district is mainly the result of:

1. Access to watercourses, enabling the construction of water plants (in most cases already existing water accumulations were used).
2. Areas of building developments and forestation of a particular commune, enabling the construction of large energy sources units (above 0,5 MW).
3. Landform that is suitable for a wind mill construction (natural hills located far from buildings and woods).
4. Awareness of local community, in respect to benefits that derives from renewable energy sources and their neutral impact on natural environment.
5. Applied funding in a particular region for households and businesses. Unfortunately, currently there are no statistics that would make it possible to specify the amount of REC installations built with or without EU funding or other forms of financial support.

The Construction of photovoltaic panels

Solar energy reaching photovoltaic solar cells is converted into electrical power. This is the result of, thanks to solid-state built of solar cell, photovoltaic effect. Photons falling on solar wafers break bonds and make it possible for electrons to move, which change their position from valance band to conductivity level, then they left behind electron holes that is positive charge carrier. On both sides of solar wafer contrary charged electric fields are created and following the connection of electrodes with a receiver, electricity is being transmitted. Prevailing material used for producing solar cells is crystal silicon. Another technologies used are thin-layer technologies (amorphous Si solar cells, CI(G)S, CdTe)[6].

The effectiveness of photovoltaic panels depends on the kind of solar cells, which constitute their main part. Solar cells are usually made of silicon, however often doped. Several basic photovoltaic panels can be listed[7]:

- monocrystalline – made of homogenous silicon, characterised by effectiveness from 15 to 20%;
- polycrystalline – made of varied silicon crystals, characterised by effectiveness from 14 to 16%,
- built from amorphous silicon – made from non-crystallized silicon, characterised by effectiveness from 6 to 10%;
- built from CdTe solar cells – usually made from one solar cell, characterised by effectiveness from 10 to 12%;
- built from CIGS solar cells – compilation of copper, indium and gal, characterised by effectiveness from 12 to 14%.

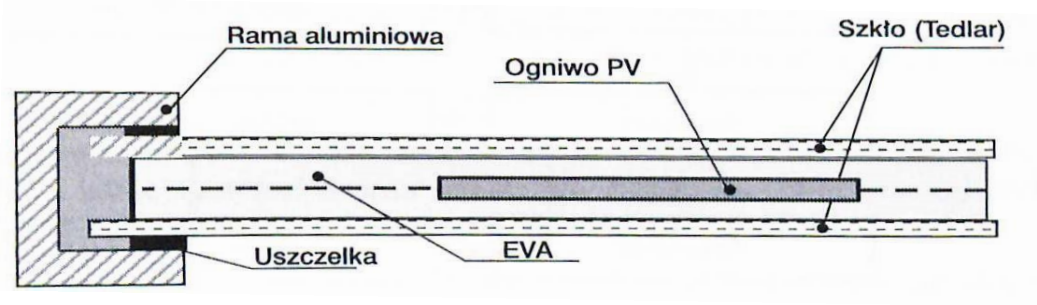
Photovoltaic modules are created by grouping photovoltaic solar cells connected in series or parallel way. Typical photovoltaic solar cell is made from semiconductor monocrystalline and polycrystalline wafers, where potential barrier was formed in the form p – n link. Thickness of solar wafers is usually between 200÷500 micrometres. Exemplary photovoltaic module cross-section was presented in the figure 7. PV solar cell is laminated for example with EVA foil, whose task is to prevent dampness from penetrating the interior and from appearing mechanical tensions. Another module part is glass, which must be very resistant to weather conditions. Moreover, it has to let in as much sunlight as possible which falling on photovoltaic solar cell breaks bonds apart. Module

[6] http://www.eupvplatform.org and http://www.fotowoltaika.edu.pl

[7] E. Klugmann-Radziemska, *Fotowoltaika w teorii i praktyce* (eng. *Photovoltaics in theory and practise*), Publishing House BTC, Legionowo 2010.

framing is created by frame typically made of aluminium (so the panel weight would be as small as possible).

Figure 7. Photovoltaic module construction



Vocabulary Reference: Rama Aluminiowa – eng. *Aluminium Frame*; Ogniwo PV – eng. *Photovoltaic cell*; Szkło (Tedlar) – eng. *Glass (Tedlar)*; Uszczelka – eng. *Seal.*

Source: http://elve.pl/blog/sprawnosc-paneli-fotowoltaicznych.

Not even shading is dangerous for solar panels which can be the result of their surface being covered with snow or leafs. As a consequence of this, electrical current is running in a reverse direction in a shaded solar panel. This leads to creating overheating points and substantial fall in a module's effectiveness. To eliminate this phenomenon bypass diodes are used, which in typical conditions are polarised in a barrage direction. However, when some solar cell's fragment is shaded, diode is polarised in the conduct direction so that the electrical current would go around shaded solar cells.

Solar panel recycling

The Primary source of silicon is silicon dioxide SiO_2, existing in a quartzite rock form or sand quartzite form. To produce PV cells an intermediate silicon (in terms of purity) is used. It is in the indirect form between silicon electronic purposes and metallurgical silicon. The demand for silicon in a photovoltaic industry is growing every year. Limitation in primary silicon sources exploitation may lead exclusively to silicon production cycle retrieved from PV cells and modules.

Sources of waste produced by photovoltaic plants might be divided into two groups: waste generated during the production process and after operational waste.

Waste generated in the production process is becoming a problem for units producing photovoltaic panels. Operational and after opera-

tional waste became or will become a major problem in the future that will have to be faced by photovoltaic plants owners, local and state authorities. That is because the forecasted PV modules exploitation time is between 20 to 30 years[8].

At present, in Poland there is no strategy for waste generated by photovoltaic industry. There is also no precise data on the amount of this kind of waste already stored in dumps all over the country.

The process of delamination can be done in a chemical or thermal way. Both ways enable retrieving materials from the used PV modules. Time needed to complete chemical delamination is long and usually exceeds several hours. The disadvantage of this method is that in the course of this process most PV cells falls apart. Moreover the process itself is of low effectiveness requiring plenty of solvent for delamination and high costs of other reagents. Another chemical method used was solar cell separation in organic solvents. In this process PV panels do not break, but the process itself takes 10 days to complete[9].

Thermal delamination of used photovoltaic modules in comparison to chemical processing is more advantageous especially in respect to the time needed to complete the process. There is also no need to recycle the solvent. However, disadvantage of this process is the emission of harmful gases when EVA copolymer is being thermally decomposed. Nevertheless, this method can recommended for commercial use in photovoltaic panel recycling units because it is not complicated and simple.

Recovery of base substrate from used photovoltaic silicon cells consists in removing from its surface undesirable layers by their digestion (dissolution in solvents or reactions with gases within the area of plasma, so that volatile materials can be created). As a result of using working substance in this process, dry and wet digestion can be distinguished. Wet digestion can be divided into two groups:

- hydrophilic method, involving oxidation and dissolution of particles in oxidizing substance (usually hydrogen peroxide),
- hydrophobic method, involving dissolution of natural oxides in solutions: HF, NH4F. Digestion in these solutions lasts from 10 to 20 minutes in is done in the temperature from 70 to 85 ˚C.

Both processes are accompanied by a large emission of gases. Pollution of organic origin in the hydrophilic method is removed by the high pH value of the substance. Whereas in the second method, they are removed by creating compounds that can be dissolved in the solution.

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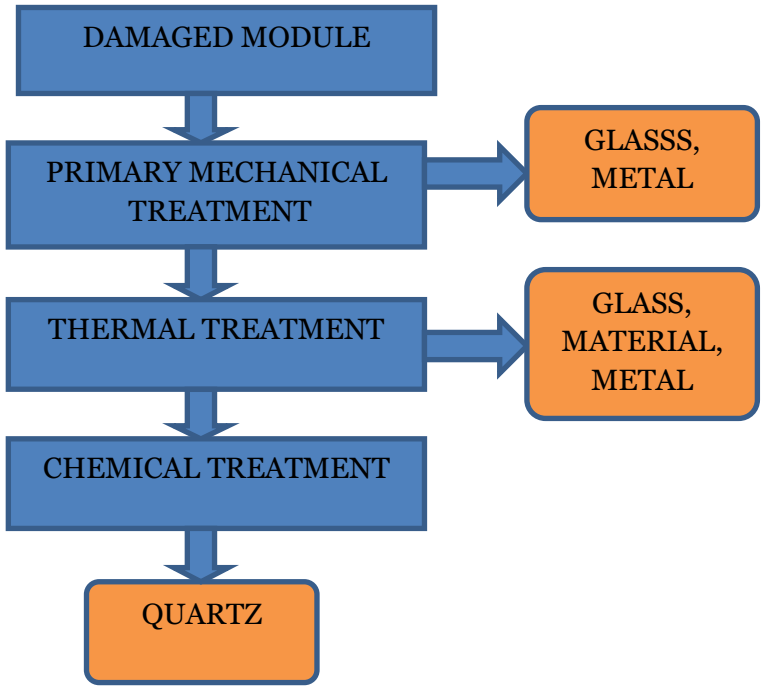
[8] V. Fthenakis, *Photovoltaic Modules Decommissioning*, [in:] *Practical Handbook of Photovoltaics*, Elsevier 2003.

[9] D. Takuya, T. Izumi, U. Hiroaki, *Experimental Study on PV Module Recycling with Organic Solvent Method*, "Solar Energy Materials and Solar Cells" 2001, vol. 67.

Figure 8. Simplified model of PV panel recycling



In order to make silicon recovery from photovoltaic cells possible, first the following elements must be removed:

- metallic elements from the front and back surface;
- anti-reflective coating;
- p – n link

Conclusions

Photovoltaics is an industry that is thriving nowadays. Worldwide growth in the amount of photovoltaic modules is at the level of 40% every year. First photovoltaic installations appeared in the 90's in 20th century, and their life cycle is estimated from 25 to 30 years. For that reason at the beginning of the 21st century there will be a great number of used photovoltaic modules. In Poland a dynamic development of photovoltaic industry started after 2010, so an issue of PV waste will appear in 2030. As a result, there is a need for creating methods and ways for photovoltaic module recycling. Otherwise, the only way of disposal will be to store them at the dumps. In reference to both technologies used nowadays and innovative ones, when producing photovoltaic panels LCA (Life Cycle Analysis) criteria should be applied to estimate PV panels life cycle.

These criteria include all possible stages of the object's life cycle (production, operation, disposal). There is a tendency among PV module producers to limit the thickness of silicon cells (and limit the costs of production as a result). In a consequence, it might prevent any possibility of recovering silicon by its multiple processing.

Non-existence of legal regulations and cheap technology solutions, shows that there is a need to create effective economic and environment friendly methods to recycle used PV modules.

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Henryk PORWISIAK*

OXYTREE FOR CLEAN AIR IN LOMZA AND BIOMASS FOR A CITY HEATING PLANT

Introduction

At the turn of the 20th and 21th centuries, many breeders from Castilla-La-Mancha University in Spain raised a new clone of *Paulownia Clon in Vitro 112 tree hybrid*. The new hybrid was bread from two species of the family of *Paulownia elongata Paulownia fortunei* and named oxytree as means an oxygen tree. The plant was registered in the Community Plant Variety Office (CPVO) in 2011 under number 115/11[1]. In 2015, the first seedings of oxytree were imported from Spain to Poland in trace amounts. According to data from Oxytree Solution Poland from Wroclaw, as a sole distributor and commercial agent of oxytree seedings, at the turn of May and July, 160 000 of oxytree seedlings[2] were planted in Poland in 2016.

At the end of December 2019, more than 600 ha of arable land was planted with oxytree trees. According to the recommendation of oxytree breeders, they should be planted on the soil complex 4-6, and in good culture even on the soil complex 7, which is very lightו Due to the well-developed root system, the oxytree trees should be planted in groundwaters under 2 m. In the case of high groundwater or floodplains, the trees have minimal growth, and the tree root system begins rotting processes.

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[1] J. Lisowski, H. Porwisiak, *Cechy biometryczne drzewa oxytree w pierwszym roku wegetacji*, "Scientific Journal of WSA Łomża" (Higher School of Agribusiness in Lomza) 2017, no. 67, pp. 56-64.
[2] J. Lisowski, H. Porwisiak, *Oxytree roślina przyszłości o uniwersalnym znaczeniu*, „Hodowca Bydła Monthly Magazine" 2016, no. 7-8, pp. 72-74.

Figure 1. The leave of oxytree in the first year of the plantation on the experimental plots of WSA Lomza. Diagonal leaves – 62 cm

Source: The author's photo of the 20.08.2019.

In April 2016 the Memorandum of Cooperation between The Rector of the Higher School of Agribusiness in Lomza and CEO of Oxytree Solutions Poland in Wroclaw was signed. The purpose of the agreement and assumed experiment was to monitor biometrical features of trees in each year of growth, growth rate and stem circuit as well as to investigate the chemical composition of fronds and energy parameters (ash content, carbon dioxide, hydrogen, combustion heat and calorific value) as a result of combustion. After the first two years of experiments on the experimental plots of the Higher School of Agribusiness in Lomza and monitored plantation it was confirmed that oxytree trees have a substantial increase in length and thickness as well as an extensive area of leaves[3].

In the first and the second growing years, the surface of one leaf should be from 2,5 to 3,0 000 cm^2 (Figure 1). The leaves of oxytree trees in the first three growing seasons are the largest, while in the following years the surface of a single leaf is slightly smaller, but as for quantity, there are much more leaves. As a result of rapid growth and a high surface area, the tree has a very high capacity to absorb large amounts of

[3] J. Lisowski, H. Porwisiak, *Drzewo tlenowe oxytree w drugim okresie wegetacji*, „Miesięcznik Biomasa" 2018a, no. 1(41), pp. 34-36.

carbon dioxide and produce more than 10 times[4] more oxygen than other leaf trees growing in Polish climate. According to the Report of the Research Group "Environmental and Forest Resources" of the Institute of Renewable Energy of Castylla-La Mancha University under the direction of Francisco Ramóna Lópeza Serrano[5], the amount of carbon dioxide sequestered by oxytree trees varies from 106 to 140 tonnes per hectare per year at 570 szt·ha^{-1}. Also, Icka and co-authors[6] state that *Paulowni* species belonging to C4 plant group, to which oxytrees also belong, need to consume 1250 tonnes of carbon dioxide from the area of one hectare of crop per year.

In April a tripartite agreement between Municipal Enterprise of Economy, the Plant Protection Institute of the National Research Institute in Bialystok and the Higher School of Agribusiness in Lomza was signed. The agreement concerns, among other things, the study of oxytree trees growing on the streets of Lomza. Based on the agreement, Municipal Greenery Plant planted 54 seedings of oxytree trees in the streets of green belts. The primary purpose of plant seedlings in street lines will be the observation of how to cope with growth and development and how many elements are extracted from soil and urban air.

In May 2019, a new field experiment on the area of 700 m^2 was established on the field of the Higher School of Agribusiness in Lomza. The purpose of the experiment was to assess the growth and acquisition of biomass as a renewable energy source (RES) for incineration of District Heating Plant in Lomza.

In the second decade of May 2019, two production plantations of oxytree trees with a total surface of 1, 2 ha were established in the municipality of Czyzew and Drohiczyn. The researchers from the Higher School of Agribusiness in Lomza monitor biometric features as well as the influence of the climate impact of Podlaski Province on the development of these plants.

In the third decade of May 2020, 54 seedlings of oxytree trees were planted in the next green belts and on the streets of Lomza. The plantations of 2.3 ha were established in the municipality of Szumowo. Many residents from Podlaski Province have planted two or three plants in

[4] M. Woźniak, A. Gałązka, M. Frąc, *Paulownia – szybko rosnące, wielofunkcyjne drzewo bioenergetyczne*, „Kosmos. Problemy nauk biologicznych" 2018, vol. 67, no. 4(321), pp. 781-789.

[5] F.R. López Serrano, *Preliminary report on hypothetical plantation performance simulation paulownia elongata x fortunei cv In Vitro 112®*, Report of February 20, 2015. Environmental and Forest Resources Department, Spain, pp. 1-6.

[6] P. Icka, R. Damo, E. Icka, *Paulownia tomentosa, a Fast Growing Timber. The Annals of "Valahia" University of Targoviste-Agriculture*, doi: 10.1515/agr-2016-0003.

order to convince themselves that *Paulownia Clon in Vitro 112* achieves the declared growth rate and has such green leaves.

Material and methods

The study material comes from the three experiments which were established in 2019 in Lomza and the territory of Czyzew and Drohiczyn Municipalities. Oxytree Solutions Poland delivered the oxytree seedlings in Wroclaw on 14th May 2019. In the first decade, soil samples were collected, and the area was then prepared for planting seedlings. In Lomza the preparation of the site consisted of determining the places for planting, drilling the holes with the diameter of 30 cm and a depth of approximately 100 cm with a gas drilling rig, dressing the holes for planting with a mixture of horticultural soil with a top layer of organic (Petro 330 ST BIO) and mineral (Polifoska 8) fertilizers.

Figure 2. Planting of oxytree seedlings on green belts along Pilsudski Street in Lomza

Source: The author's photo of the 23.05.2019.

The oxytree seedlings were planted on the surface of 700 m^2 in three rows at a distance of 6 meters between rows in the experiment of WSA in Lomza. The distance between the seedlings in the row ranged from 2,5 to 4 m. The whole experiment is set up in two replicates.

In the town of Lomza, oxytree seedlings were planted in five places along street lanes: in three places with very heavy traffic (intersection of Pilsudski Street and Zawadzka Street, Figure 2) and in two places with

heavy traffic of lorries (Wojska Polskiego Street, the national road DK 61 and Poznanska Street).

In the grasslands of Czyzew and Drohiczyn Municipalities, in the first decade of April, the herbicide Rosate Clean 360 SL in a quantity of 5 $l \cdot ha^{-1}$ was used, and after 12 days plowing at a full plow thickness was made. At the beginning of the second decade, POLIFOSKĄ® START mineral fertilization rate of 100 $kg \cdot ha^{-1}$ was used, and the treatments such as cultivating, harrowing, string roller were applied. Having completed the healing procedures, the rows were set, and the stakes were put every 4 m. The width of the rows was also 4 m. Oxytree seedlings were planted in such prepared positions without the recommended drilling of holes but in a deeply tilled soil.

In all three experiments, soil disturbance around the trees were the main areas of care. The grass was mowed in the case of seedlings in the town of Lomza and the experiment of WSA in Lomza. On the production plantation in Czyzew and Drohiczyn Municipalities, inter-rows were kept in black fallow. The seedlings planted in the town of Lomza were covered with a protective net against pets. Oxytree seedlings which were planted on the experimental plots of WSA were fenced with a forest mesh to protect against domestic and field animals.

The plantation in Czyzew was fenced with a forest mesh or a permanent fence. From the north, sunchoke, which serves as a buffer zone from neighbouring fields, is growing in addition to the forest mesh.

The macro and micro-nutrient content of soil and pH of soil were identified in the Chemical and Agricultural Station in Bialystok based on the soil samples taken from the various experiments before planting. The height of seedlings was measured using a measuring tape. The trunk diameter of 20 cm from the ground was measured utilizing a vernier calliper, and the stem circuit was calculated from a mathematical formula. The measurements were made at the end of the growing season.

The length of a growing season for the planted oxytree seedlings was 148 days. The growing season for oxytree seedlings was accepted from the date of the planting of the seedlings until the first frost. The temperature and the amount of precipitation during the growing season were obtained from the Experimental Department of Variety Assessment in Marianowo.

The oxytree biomass study on sulphur, ash, hydrogen, coal, calorific value and combustion heat was carried out in 2020 in a Certified Chemical Research Laboratory for Fuel Research in Energa Elektrownie Ostrołeka SA in Ostroleka Town.

Results and discussions

The soil where the oxytree seedlings were planted was characterized by different levels macro and micronutrients as well as a broad range of pH. The soil was very acidic, phosphorus content was high, and there was a medium level of potassium and magnesium in the experiment in WSA in Lomza. There was a high level of phosphorus and magnesium, and the soil was neutral in the production plantation in Czyzew Municipality.

Five samples of soil taken from green belts on-road strips along the streets of Lomza showed an alkaline reaction and the phosphorus content was medium, high and very high depending on the place. The potassium content in the samples was ranged from very low to medium, and magnesium level ranged from low to medium. Changes in the soil profile must explain the vast span of the macroelements content during the construction or conversion period of roads and communication routes at the last 30 years.

The boron content of all the established experiments was low while the manganese content, except for the experiment in WSA in Lomza where the content of this element was high. The content microelements of copper and iron in all the soil samples taken before the planting of oxytree seedlings were on a medium level: for copper from 2,5 to 4,4 $mg \cdot kg^{-1}$ of soil and for iron from 880 to 1155 $mg \cdot kg^{-1}$ of soil. The zinc content of all soil samples was medium and high from 8,7 to 71 $mg \cdot kg^{-1}$ of soil. The macro and microelements content of the test soil samples is given in Table 1.

Table 1. Soil abundance in absorbable macro and micronutrients and pH

The location of the soil sample taken	pH in KCl	Nutrient content in mg per 100 g of soil			Nutrient content in $mg \cdot kg^{-1}$ of soil			
		phosphorus	potassium	magnesium	boron	manganese	copper	zinc
Experiment WSA in Lomza	4,4	16,6	11,3	4,3	<50	135,5	4,4	71,0
Experiment Czyzew	7,0	38,2	21,5	20,0	1.06	155,2	4,0	12,6
Lomza Zawadzka Str	7,5	20,5	13,9	5,6	1,21	122,1	3,6	11,4

Lomza Pilsudski Str./ from the side of Kaufland	7,9	11,1	7,1	3,6	0,54	106,1	2,9	10,5
Lomza Pilsudski Str./ from the side of PKO	7,6	19,0	16,6	6,8	8,89	162,0	3,6	8,7
Lomza Poznanska Str.	7,9	18,5	8,3	3,5	0,70	101,3	2,6	12,0
Lomza Wojska Polskiego Str./ Cementry	7,6	22,9	14,5	5,0	0,91	104,1	2,5	9,7

Source: Own study based on the report of OSCHR w Bialymstoku, the year 2019.

Climate conditions during the first growing months were not favourable. Deficient precipitation of snow during the winter period and little rain in April (only 3,7 mm) increased the drought in 2018. Only at the end of the second decade and at the beginning of the third one 113,9 mm of rain fell. Such torrential rain caused water to flow from the soil, and it did not penetrate deep into the soil profile. The amount and form of the rainfall slightly improved the soil moisture conditions a little. The average daily temperature in May in the first decade was quite low – 8,38 ^{o}C. The temperature and moisture of the soil allowed for a fairly good increase in oxytree seedlings only in the second and in the third decades' Table 2.

Table 2. Temperature and precipitation in the period April – October 2019

Month	Temperature [^{o}C]			Average of many years 1988-2018 [^{o}C]	Precipitation [mm]		
	I decade	II decade	III decade		I decade	II decade	III decade
April	6,55	6,03	13,33	8,07	0,4	0	3,3
May	8,38	13,61	15,27	13,50	2,1	91,2	22,7
June	19,56	21,89	19,70	16,51	4,3	21,2	9,6
July	15,87	16,32	20,20	18,72	27,2	9,2	70,3
August	17,06	19,04	19,25	18,05	50,6	20,2	9,1
September	16,84	12,15	10,81	12,93	8,1	7,9	25,2

October	7,59	13,72	9,01	7,81	33	0,3	2,7
Average of temperatures (IV-X)	13,1	14,7	15,3	13,6			
Amount of precipitation (IV-X)					125,7	150,0	142,9

Source: Own study based on the data from the Experimental Department of Variety Assessment in Marianowo.

In June the amount of rainfall was 35,1 mm and less than 48% in comparison to the rainfall over the same time period. June 2019 will be recorded in the history of climatology due to the highest temperatures. The temperature was 38,2 °C in Radzyn (Lubuskie Province) by Slawski Lake. The average daily temperature in June 2019 was 20,4 °C. It was the highest daily average temperature of the whole growing season. In June 2019, the average daily temperature was higher by 3,9 °C compared to the average temperature from the multi-year period of the same month. The average daily temperature of July 17,5 °C – it was lower by 1,2 °C from the average over the long period. The amount of rainfall in July 2019 was 106,7 mm, 70,3 mm of which fell in the last two days of the third decade. August was characterized by 0,5 °C higher average daily temperature of the month compared to the average over the long period, and relatively significant atmospheric precipitation increasing oxytree trees. The average daily temperature in August was 13,3 °C. It was by 0,4 °C higher in comparison with the average over the long period. The amount of rainfall in September 2019 was by 25% lower than the amount of precipitation in the same time interval. During the first days of October, the temperature dropped below 0 °C for two days resulting in the suspension of the oxytree vegetation.

The average daily temperature was of the seven months in 2019 was 14,4 °C, and it was by 0,8 °C higher than the multi-year average in the same time interval. The total precipitation during the seven months was 418,6 mm, and it was 15,9 mm higher than the sum of precipitation from many years. It should be emphasized once again that the distribution of precipitation in individual months and decades was uneven and the lack of precipitation in individual phases of oxytree growth resulted in their weaker increase growth[7].

In the third decade of October, biometric measurements of tree height, a trunk diameter, a trunk circumference were made. The average results of the measurements are summarised in Table 3.

[7] M. Liszewski, P. Bąbelewski, *Dynamika wzrostu oxytree w pierwszym roku prowadzenia plantacji*, „Biomasa Monthly Magazine" 2017, no. 3, pp. 24-26.

A significant difference in the growth of trees should be explained by the properties of the soil as well as the implementation of care treatment in the first growing season. The places for seedlings in Lomza were equally prepared. The debris and gravel, which remained after the construction of the road,was visible and excavated while drilling holes for planting oxytrees in some places. A layer of peat mixed with light earth which was 5-6 cm thick was added on top to allow sown grass to grow and create peat. Lawn sward surrounding the oxytree stalks used food ingredients that were intended for oxytree seedlings. The height and growth rate and the dark green colour of leaves were visible. The root system of oxytree seedlings could not develop well. The height of the oxytrees ranged from 112 to 205 cm in places with good soil conditions. The height of the plants did not exceed 60 cm in bad soil conditions. The highest oxytree was 208 cm high, and the thickness of the trunk at the height of 20 cm was 35mm. The average diagonal of the leaf was 51 cm.

Table 3. Average results of oxytree measurements

Place of plantation	Height of oxytree [cm]	Daily increase [cm]	A trunk diameter at the height of 20 cm from the ground [mm]	A trunk circumference at the height of 20 cm from the ground [mm]	The Average diagonal of the leaf [cm]
Experiment WSA	157	1,06	35	109,9	61
Town Area of Lomza	95	0,64	19	60,0	51
Plantation Czyżew Municipality	194	1,31	38	119,3	65
Average	149	1,01	31	97,3	57

Source: Own study based on measurements and calculations.

Competitive vegetation, which was systematically mowed, grew in rows during the experiment at the Higher School of Agribusiness in Lomza. The growth of oxytree trees was more even and ranged between 120 and 210 cm. The average trunk circumference was almost 11 cm, and the average leaf diameter was 61 cm.

All the interrow and rows were maintained in black fallow only in Czyzew and Drohiczyn Municipalities (Figure 3). The height of the trees

was very balanced both in terms of the height and thickness of the trunk. The average height of the trees at the end of the growing season was 194 cm, and the daily increment was 1,31 cm. The average trunk circumference of *Paulowni Clon in Vitro 112* after the first year was almost 12 cm, and the average diagonal of the leaf was 65 cm.

The second factor affecting the growth of oxytree seedlings is the soil complex which was planted with seedlings. It is difficult to determine the composition of the granulometric soil in Lomza, where the oxytree seedlings which were planted. According to the available knowledge, this is the complex 6. In the experiment of WSA in Lomza (the Higher School of Agribusiness in Lomza) the oxytree seedlings were planted on the appropriate rich soil produced from boulder sands of IV botanical class of good rye complex. The production plantation in Czyzew Municipality was established on the brown earth soil of an excellent IIIa botanical class of rye complex. Watering in a very critical period without precipitation was entirely important for growth. Lisowski and Porwisiak[8] found similar growth of oxytree seedlings in the first year.

Figure 3. Oxytree Plantation in Czyżew Municipality

Source: The author's photo of the 04.09.2019.

Soil pH was the third factor which had an impact on the growth of oxytree. Soil pH was neutral and alkaline both in the streets of Lomza and in Czyzew Municipality while soil pH was very acidic on the experi-

[8] J. Lisowski, H. Porwisiak, *Oxytree – drzewem XXI wieku*, [in:] M. Kosmala (ed.), *Tereny zieleni w ochronie powietrza*, Polish Association of Sanitary Engineers and Technicians, Branch in Toruń 2018, pp. 159-170.

mental plots of WSA in Lomza. According to plant breeders, the soil for establishing plantations should be slightly acidic to neutral.

The statements that *Paulownia Clon in Vitro 112* is a tree which grows rapidly are confirmed.

In November 2019 several trunks of one-year oxytree trees were cut down. After drying and grinding wood chips and the pellet made of wood chips were transferred to Chemical Research Laboratory for Fuel Research in Energa Elektrownie Ostrołeka SA in Ostroleka Town in order to perform the tests on energy parameters as a result of biomass combustion. The results are presented in Table 4.

Table 4. Results of energy characteristics for oxytree biomass in working condition

The survey characteristics	Unit of measurement	Oxytree Wood Particles	Oxytree Pellet
Total moisture content	%	7,9	6,6
Ash content	%	1,9	1,2
Total sulfur content	%	0,03	0,02
Total carbon content	%	46,4	46,0
Hydrogen content	%	5,61	5,59
Combustion heat at constant volume	$kJ \cdot kg^{-1}$	18114	18610
Calorific value at constant volume	$kJ \cdot kg^{-1}$	16777	17308
Calorific volume at constant pressure	$kJ \cdot kg^{-1}$	16701	17231

Source: Own study based on the report of Energa Elektrownie Ostrołęka SA Chemical Research Laboratory for the Fuel Research Centre in the year 2019.

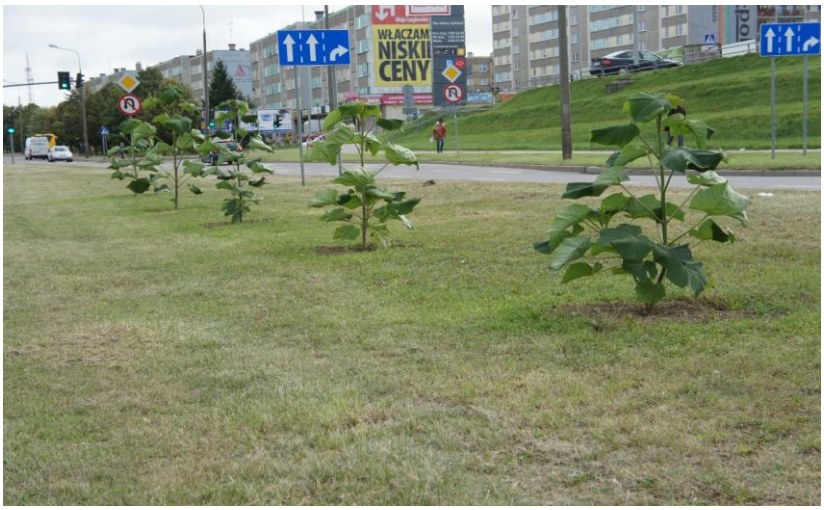
The ash and sulphur content as a result of wood chips or pellets burning was minimal compared to the amount of burnt coal ash burned. Large amounts of ash resulting from the combustion of coal in power plants lead to the creation of a primary storage problem[9].

Wood chips or pellets of oxytree wood have only a 30% lower net calorific value from the coal which was burnt in power plants. By burning woods chips or pellets made from plants included in group C-4 in

[9] U. Lorenz, *Skutki spalania węgla kamiennego dla środowiska przyrodniczego i możliwości ich ograniczania*, Mat. Szkoły Eksploatacji Podziemnej. Sympozja i Konferencje no. 64. Issued in Mineral and Energy Economy Research Institution, Polish Academy of Sciences, Cracow 2005 pp. 97-112.

power plants classified in group C4 in individual boilers called fluidized boilers the ash might be used as a by-product to fertilize crops by agricultural producers Main fluidized boilers are fitted for steam and hot water production in the energy sector. According to the Internet information[10], biomass – fired furnace has been working in Municipal Heat Supply Company in Lomza since January 2020. The daily demand for biomass is 90 tonnes in the production 1000GJ of heat. Activation of the boiler to burn biomass is not only air protection but also an economic factor for reducing CO_2 emissions.

Figure 4. Oxytree trees in Pilsudski Street in Lomza after 16 days of vegetation



Source: The author's photo of the 16.09.2020.

The oxytree trees planted in Lomza at the significant local and national roads as a result of the increased capacity of carbon dioxide absorption[11] will lead to cleaner air for the inhabitants of the town in three years.

Furniture industry should be interested in the rapid increase in height and thickness of a trunk and the possibilities of regrowth several times after cutting the trunk. Currently there are no Polish studies on the property of oxytree wood in Institute of Wood Technology

[10] *Ciepło z biomasy już w mieszkaniach*, https://4lomza.pl/index.php?wiad=54505 [26.05.2020].
[11] M. Woźniak, A. Gałązka, M. Frąc, *Paulownia – szybko rosnące, wielofunkcyjne drzewo bioenergetyczne*, „Kosmos. Problemy nauk biologicznych" 2018, vol. 67, no. 4(321), pp. 781-789.

Based on the data from the Internet site[12], oxytree wood is lighter in comparison with other species (dry density 300-400 kg·m^{-3}). It also has a high flammability temperature (420-430^{o} C), and it is easy to process. It is flexible, not distorted, waterproof, insulated, homogenous, free of knots and wax.

Conclusions

In the year 2019, the planted seedlings of *Paulownia Clon in Vitro 112* obtained an average height of 149 cm with an average diameter of 31 mm measured at the height of 20 cm from the ground *in the three experiments* during 148 days of vegetation.

The calorific value of the combustion heat is an average of 18 363 kJ*kg^{-1} with an average ash content of 1,55% and an average sulphur content of 0,025% as a result of burning wood chips and pellets produced from a one-year-old trunk.

The average leaf diameter was 57 cm from the three experiments in the first year after planting.

Larger plantations of *Paulowni Clon in Vitro 112* should be established in order to protect forests in Poland not only for aesthetic purposes but, above all, as air protection and the extraction of raw material for the energy sector.

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[12] *Właściwości drewna oxytree*, http://oxytree.pl/ [26.05.2020].

20 th February 2015. Environmental and Forest Resources Department, Spain 2015, pp. 1-6.

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https://4lomza.pl/index.php?wiad=54505.

http://oxytree.pl/.

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NON-GOVERNMENTAL ORGANIZATIONS AS ENTITIES AUTHORIZED TO RUN POINTS OF FREE LEGAL ASSISTANCE AND FREE CIVIC COUNSELING. COMMENTS ON THE BACKGROUND OF THE PODLASKIE VOIVODESHIP

Introduction

The system of free legal assistance began operating in Poland from the beginning of 2016[1]. It was introduced on the basis of the Act of 5 August 2015 on Free Legal Assistance and Legal Education[2]. On June 15, 2018, an amendment was adopted which introduced significant changes in the functioning of the abovementioned Act. Its scope was broadened, among others for free civic counseling (from January 1, 2019) and free mediation (obligatory from January 1, 2020), and the catalog of people authorized to use the system has been expanded[3]. Pursuant to the Act of 5 August 2015 on Free Legal Assistance, Free Civic Counseling and Legal

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[1] The literature postulated the introduction of a unified system of free legal aid, see: A. Klich, *Idea pomocy prawnej w sprawach cywilnych a działalność klinik prawa*, [in:] K. Flaga-Gieruszyńska, G. Jędrejek (eds.), *Aequitas Sequitur Legem. Księga Jubileuszowa z okazji 75. Urodzin Profesora Andrzeja Zielińskiego*, Warszawa 2014, p. 223.

[2] The Act of 5 August 2015 on Free Legal Assistance and Legal Education (Journal of Laws of 2015, item 1255). *Ratio legis* of the Act was to provide assistance to people in difficult financial situation, see: D.E. Lach, *Nieodpłatna pomoc prawna jako element zabezpieczenia społecznego*, „Ruch Prawniczy, Ekonomiczny i Socjologiczny" 2016, no. 3, p. 21; A. Rogacka-Łukasik, *Zakres zastosowania regulacji prawnej o nieodpłatnej pomocy prawnej*, „Roczniki Administracji i Prawa" 2016, no. 1, p. 302; O. Hałub, *Konstytucyjne gwarancje prawa do nieodpłatnej pomocy prawnej na etapie przedsądowym*, „Forum Prawnicze" 2016, no. 4, pp. 74-75.

[3] The Act of 15 June 2018 amending the Act on Free Legal Assistance and Legal Education, as well as some other acts (Journal of Laws 2018, item 1467).

Education[4], assistance is provided at points run by advocates and legal advisers and non-governmental organizations conducting public benefit activities. There are over 1,500 points of free legal assistance and free civic counseling throughout Poland[5], located in a way that allows comparable conditions of access to assistance for all citizens[6]. The organization of the system is a commissioned task in the field of public administration, financed from a targeted subsidy from the state budget, performed by local government units – districts and cities with district rights (municipalities performing district tasks)[7]. Half of the points are entrusted to guide lawyers for the purpose of providing free legal assistance, and half of NGOs for the purpose of providing free legal assistance or providing free civic counseling. This article will analyze whether in all district and cities with district rights in the Podlaskie Voivodeship the NGO was entrusted with running points in 2020 and whether selected entities meet the requirements of Article 11 paragraph 1 of the Act on Free Legal Assistance, i.e. they have the status of a non-governmental organization conducting public benefit activities.

Free legal assistance – subjective and objective scope

Any natural person (including sole trader who didn't employ other persons during last year) who makes a declaration that he or she is not able to bear the costs of paid legal assistance is entitled to receive free legal assistance. Therefore, the legislator makes the option of providing free legal assistance conditional upon submission of an appropriate statement containing the name and surname, address of residence and PESEL number (or, in the absence of it, the number of another document confirming identity) of an authorized person. The sole trader additionally makes declaration about not employing other persons during last year. The declaration is submitted to the person providing free legal

[4] The Act of 5 August 2015 on Free Legal Assistance, Free Civic Counseling and Legal Education (Journal of Laws of 2019, item 294), hereinafter "Act on Free Legal Assistance".

[5] https://darmowapomocprawna.ms.gov.pl/pl/darmowa-pomoc-prawna-i-poradnictwo-obywatelskie/news,7458,darmowa-pomoc-prawna---poradnictwo-obywatelskie.html [24.04.2020].

[6] See: J. Winczorek, *O potrzebie badań empirycznych nad dostępem do prawa*, „Państwo i Prawo" 2016, no. 12, p. 27.

[7] Article 8 paragraph 1 and Article19 paragraph 1 of the Act on Free Legal Assistance in connection with Article 92 paragraph 2 of the Act of June 5, 1998 on District Self-Government (Journal of Laws of 2019, item 511). See: S. Płażek, *Nowe usługi powiatu w zakresie nieodpłatnej pomocy prawnej*, [in:] M. Mączyński, M. Stec (eds.), *Działalność gospodarcza jednostek samorządu terytorialnego – dopuszczalność i granice jej prowadzenia*, Warszawa 2016, pp. 290-309.

assistance[8]. There are no legal instruments that would allow you to verify the accuracy of the submitted declarations.

The scope of free legal assistance is regulated by Article 3 paragraph 1 of the Act on Free Legal Assistance, according to which it includes informing the authorized person about the current legal status, their rights or obligations or indicating how the authorized person can solve his or her legal problem. Assistance to an authorized person also includes the preparation of a draft letter, with the exception of pleadings in pending cases, both at the preparatory and judicial stage (including administrative court proceedings), preparation of a draft application for exemption from court costs or the appointment of an attorney *ex officio* in court proceedings, as well as preparing an application for establishing a legal advisor, advocate, patent attorney or tax advisor in court and administrative proceedings. At the same time, the authorized person should be informed about the costs of the trial and the financial risk associated with bringing the case to court. As part of free legal assistance, free mediation can also be conducted.

In points entrusted to conduct non-governmental organizations, free legal assistance may be provided by an advocate, legal advisor, tax advisor – in matters of tax law, except for tax matters related to business operations and a master of law with at least 3 years of experience in undertaking activities requiring possession legal knowledge and directly related to providing legal assistance. An additional condition for a person who has completed law studies and obtained a master's degree is the exercise of full public rights, full legal capacity and no criminal record. In the scope of free mediation, a mediator can also provide assistance[9].

The amendment of 15 June 2018[10] significantly expanded the catalog of persons authorized to use the system of free legal assistance. Before January 1, 2019, the subjective circle of system beneficiaries was limited only to a well-defined category of people constituting about 1/3 of adult Poles[11]. Eligible persons include youth (persons under 26 years of age), seniors (persons over 65 years of age), veterans, persons receiving social assistance benefits granted under the Social Assistance Act, holders of a valid Large Family Card, persons threatened or injured as a result of natural disaster or technical failure, pregnant women[12]. The literature rightly pointed out the lack of logic and ambiguity in the crite-

[8] Article 4 of the Act on Free Legal Assistance.
[9] Article 11, paragraph 3 of the Act on Free Legal Assistance.
[10] Act of 15 June 2018 amending the Act on Free Legal Assistance and Legal Education, as well as some other acts (Journal of Laws 2018, item 1467).
[11] See: J. Winczorek, op. cit., p. 28.
[12] See: P. Sokal, *Pozytywy oraz trudności nieodpłatnej pomocy prawnej – próba oceny*, „Monitor Prawniczy" 2017, no. 9, Legalis.

rion for selecting system beneficiaries. It was pointed out that "categories of persons included in the Act (on free legal assistance and legal education – author's note) belong to those who have the fewest life problems that can be solved by law"[13]. Considering the above, the extension of the catalog of authorized persons to all persons who are not able to bear the costs of paid legal assistance should be positively assessed[14]. On the other hand, it should be borne in mind that well-off people can also benefit from free legal assistance (submission of a declaration is formal and is not subject to verification), which may limit access to legal assistance for the poor, in particular in points of high interest beneficiaries.

Free civic counseling – subjective and objective scope

In accordance with Article 3a paragraph 1 of the Act on Free Legal Assistance "Free civic counseling covers activities tailored to the individual situation of the entitled person, aimed at raising the awareness of that person about his or her rights and obligations, and support in solving the problem independently, including, if necessary, drawing up a plan with the authorized person activities and assistance in its implementation. Free civic counseling includes, in particular, advice for people in debt and housing and social security matters". As part of free civic counseling, free mediation may also be conducted (Article 3a paragraph 2 of the Act on Free Legal Assistance).

Just like in the case of free legal assistance, any natural person who makes a statement that he or her is not able to bear the costs of paid legal assistance is entitled to receive free citizenship counseling. The sole trader additionally makes declaration about not employing other persons during last year. The declaration is submitted to the person providing free civic counseling (Article 4 paragraph 2 of the Act on Free Legal Assistance). The legislator has specified that advisers are persons entitled to provide free civic counseling. An adviser is a person with higher

[13] J. Winczorek, op. cit., p. 28.

[14] This solution, however, also met with criticism from the Supreme Bar Council, which postulated the introduction of an income criterion. See: A.S. Bartnik, K.J. Kowalska, *Nieodpłatna pomoc prawna*, Warszawa 2019, p. 66. In Resolution No. 79/2018 of 19 June 2018, the Presidium of the Supreme Bar Council indicated that "the Act should precisely define the circle of entitled persons (...). The criterion authorizing the use of free legal assistance, which comes down to submitting a statement that the entitled person is not able to bear the costs of paid legal assistance, paradoxically significantly limits access to free legal assistance, excluding persons in financial difficulties who, however, become to cover the low cost of paid pre-judicial legal assistance". See: http://www.adwokatura.pl/admin/wgrane_pliki/file-uchwala-nr-79-2018-23655.pdf [24.04.2021].

education, "completed a positive training in the field of civic counseling (...) or has experience in providing civic counseling and obtained a certificate confirming the possession of knowledge and skills in this field issued by the entity authorized to conduct training and a refresher course"[15]. The training includes at least "70 hours of civic counseling classes, of which at least 15 hours are allocated to counselor work methodology classes and at least 20 hours for counseling classes for indebted persons" (Article 11a paragraph 1 of the Act on Free Legal Assistance). In addition, the adviser is obliged to attend at least an 8-hour training course at least once a year (Article 11a paragraph 2 of the Act on Free Legal Assistance)[16].

It is difficult to clearly indicate what were the aims of the legislator in establishing civic counseling. The explanatory memorandum to the draft act indicated that "Counseling in general, and especially civic counseling, undoubtedly facilitates navigating the legal system, prevents social marginalization of people who use counseling, helps solve problems of already excluded people, and thus facilitates their return to society. It is also a practical form of legal and civic education"[17]. It seems that the above objectives are already implemented by free legal assistance, and the introduction of a new form of assistance in the form of civic counseling only complicates the system unnecessarily.

Non-governmental organizations

Running points can be entrusted to non-governmental organizations conducting public benefit activities[18]. Non-governmental organizations are selected in annual open competitions for offers[19] organized in each voivodeship by district and cities with district rights. In offer competitions, non-governmental organizations may submit offers for operating a point of free legal assistance and/or free civic counseling. If the of-

[15] Article 11 paragraph 3a of the Act on Free Legal Assistance.

[16] As a side note, it is worth pointing out the high costs of training and examination, which total PLN 3999. The cost of the exam is PLN 999. The refresher course costs PLN 750. See: http://zbpo.org.pl/szkolenia/cennik/ [27.04.2020]. Training and further training courses in the field of civic counseling can only be run by union of associations that have been recognized as entities authorized to conduct this type of activity by the Minister of Justice by means of an administrative decision (Article 11b of the Act on Free Legal Assistance).

[17] Justification to the draft act amending the Act on Free Legal Assistance and Legal Education, as well as some other acts (Sejm print no. 1868 of 2 August 2017), p. 3.

[18] Article 11 paragraph 1 of the Act on Free Legal Assistance.

[19] Article 11 paragraph 2 of the Act on Free Legal Assistance. The competition referred to in the Act of 24 April 2003 on Public Benefit and Volunteer Work (Journal of Laws of 2019, item 688).

fer of a free civic counseling service would not be affected by any offer or if none of those received did not meet the formal conditions, then the organization would be entrusted with running a free legal assistance point[20]. In the event that a non-governmental organization is not selected by November 30 of a given year, the head of the district (the starost)/ the president of the city does not conclude a contract with the organization or terminates the contract, points will be entrusted to legal advisors and advocates for the purpose of providing free legal assistance[21].

Running a point can be entrusted only to an organization included in the list of "non-governmental organizations authorized to run points in the voivodeship"[22]. Non-governmental organizations can apply for entry on the list in the scope of free legal assistance, free civic counseling and free mediation. Eleven entities are currently entered on the list maintained by the Podlaski Voivode[23]. The list of these organizations is given in Table 1 below.

Table 1. List of non-governmental organizations authorized to run points in the Podlaskie Voivodeship

No.	Organization name	Date of decision about entry on the list		
		Free legal assistance	**Free civic counseling**	**Free mediation**
1.	Togatus Pro Bono	10 July 2019	29 August 2019	–
2.	Caritas of the Archdiocese of Białystok	14 August 2019	14 August 2019	14 August 2019
3.	„Gołębie Serce" Foundation	28 August 2019	28 August 2019	–
4.	„Sursum Corda" Association	11 September 2019	11 September 2019	11 September 2019
5.	„Pryzmat" Social Activity Center	16 September 2019	16 September 2019	16 September 2019
6.	„Inicjatywa Kobiet Aktywnych" Foundation	20 September 2019	20 September 2019	20 September 2019
7.	Association for the Suppport of	23 October	23 October	–

[20] Article 11 paragraph 2a and 2b of the Act on Free Legal Assistance.
[21] Article 11 paragraph 12 in connection with Article 10 paragraph 2 of the Act on Free Legal Assistance.
[22] Article 11d paragraph 1 of the Act on Free Legal Assistance.
[23] As of April 29, 2020.

	Citizen's Counseling	2019	2019	
8.	Europartner Academic Club for European Integration	29 October 2019	29 October 2019	29 October 2019
9.	„Spe Salvi" Foundation	06 November 2019	–	06 November 2019
10.	Łosice Development Association - EQUUS	21 November 2019	21 October 2019	–
11.	ibuk.org.pl Foundation	22 November 2019	22 November 2019	–

Source: Own study based on the data contained in the Public Information Bulletin of the Podlaskie Voivodeship Office in Białystok[24].

The table above shows that all organizations except the "Spe Salvi" Foundation, which has no civic counseling rights, are entitled to run points for free legal assistance and free civic counseling. Most of them (six entities) are also listed for free mediation. Almost half of the entities (five organizations) are authorized to operate in all three support systems.

The entry on the list of non-governmental organizations authorized to run points the Caritas of the Archdiocese of Białystok remains questionable, because it is a church organization within the meaning of Article 34 paragraph 1 point 1 of the Act on the Relationship between State and the Catholic Church in the Republic of Poland[25]. The notion of non-governmental organization has not been defined in the Act on Free Legal Assistance. In this regard, reference should be made to the definition contained in Article 3 paragraph 2 of the Act on Public Benefit and Volunteer Work[26], according to which non-governmental organizations are legal persons or organizational units without legal personality, to which a separate act grants legal capacity, including foundations and associations that are not, first of all, units of the public finance sector within the meaning of the Public Finance Act or enterprises, institutes research, banks and commercial law companies that are state or local government legal entities, secondly, they do not act to make a profit. All organizations entered on the list kept by the Podlaski Voivode function as associations

[24] https://puw.bip.gov.pl/prowadzone-rejestry/lista-organizacji-pozarzadowych-uprawnionych-do-prowadzenia-na-obszarze-wojewodztwa-podlaskiego-punktow-w-zakresie-udzielania-nieodplatnej-pomocy-prawnej-swiadczenia-nieodplatnego-poradnictwa-obywatelskiego-oraz-prowadzenia-nieodplatnej-mediacji.html [29.04.2020].
[25] The Act of 17 May 1989 on the Relationship between State and the Catholic Church in the Republic of Poland (Journal of Laws 2019, item 1347).
[26] See: M. Kaczocha, *Commentary on Article 11*, [in:] *Ustawa o nieodpłatnej pomocy prawnej i edukacji prawnej. Komentarz*, LEX 2016.

or foundations, except for the Caritas of the Archdiocese of Białystok, which is a church legal entity. Article 3 paragraph 3 point 1 of the Act on Public Benefit and Volunteer Work stipulates that public benefit activities may also be carried out by "legal persons and organizational units operating on the basis of provisions on the relationship between State and the Catholic Church in the Republic of Poland, on the relationship between State and other churches and religious associations as well as guarantees of freedom of conscience and religion, if their statutory objectives include public benefit activities". According to Michał Poniatowski, the church legal person is a non-governmental organization in a broad sense (*sensu largo*), provided that it carries out public benefit activities, its purpose is not to make a profit and not to be included in the public finance sector[27]. A similar view is presented by Mariusz Kaczocha. The author indicates that if the entity specified in Article 3 paragraph 3 of the Act on Public Benefit and Volunteer Work (in particular a church legal person) meets all the conditions of paragraph 2 of this provision, then it is possible to entrust him with conducting points pursuant to Article 11 paragraph 1 and 2 of the Act on Free Legal Assistance[28].

These views cannot be accepted for the following reasons. It should be noted that the legislator is consistent in using the concept of non-governmental organization and entities listed in Article 3 paragraph 3 point 1 of the Act on Public Benefit and Volunteer Work (church legal persons and church organizational units)[29]. By way of example, Article 20 paragraph 1 of the Act on Public Benefit and Volunteer Work states that "a public benefit organization may be a non-governmental organization and an entity mentioned in Article 3 paragraph 3 point 1 (...)". Subjective dualism as defined in Article 3 of Act on Public Benefit and Volunteer Work clearly indicates the distinction between NGOs and church organizations[30]. In the judgment of 19 October 2017, reference number act I SA/Ke 506/17, the Voivodeship Administrative Court in Kielce stated: "When defining the concept of non-governmental organizations, the legislator did not include entities that, although having legal personality or being organizational units, fall into the category of entities indicated in Article 3 paragraph 3 of the Act (on Public Benefit and Volunteer Work – author's note)". According to the above, despite the fact that Caritas of the Archdiocese of Białystok carries out public benefit activi-

[27] See: M. Poniatowski, *Aktualna problematyka nabycia przez kościelne osoby prawne statusu organizacji pożytku publicznego*, „Kościół i Prawo" 2015, no. 1, p. 128.
[28] See: M. Kaczocha, op. cit.
[29] See: Judgment of the Provincial Administrative Court in Kielce of October 19, 2017 (I SA/Ke 506/17).
[30] See: J. Blicharz, A. Huchla, *Ustawa o działalności pożytku publicznego i o wolontariacie. Komentarz*, LEX 2008.

ties, it does not have the status of NGO. Nevertheless, it is necessary to divide the view that the entities specified in Article 3 paragraph 3 point 1 of the Act on Public Benefit and Volunteer Work were equated with non-governmental organizations in rights and obligations[31]. For this reason, *de lege ferenda*, it is necessary to postulate an amendment to the provisions of Act on Free Legal Assistance by explicitly indicating, apart from non-governmental organizations, also the entities specified in Article 3 paragraph 3 point 1 of the Act on Public Benefit and Volunteer Work.

In 2019, district and cities with district rights for the first time announced open call for tenders, in which only non-governmental organizations entered on the list kept by the Podlaski Voivode could apply for entrusting with free legal assistance and/or free civic counseling points in 2020. List of organizations selected in the above competitions can be found in the table below.

Table 2. List of entities operating points of free legal assistance and/or free civic counseling in the Podlaskie Voivodeship in 2020

No.	Name: district/city with district rights	Organization name	Number of points
1.	Augustów District	"Gołębie Serce" Foundation	1 FLA/FCC*
2.	Bielsk District	"Sursum Corda" Association	1 FLA/FCC
3.	City of Białystok	"Spe Salvi" Foundation	3 FLA**
		"Sursum Corda" Association	3 FCC***
4.	Białystok District	Caritas of the Archdiocese of Białystok	2 FLA/1 FCC
5.	Grajewo District	"Gołębie Serce" Foundation	1 FLA/FCC
6.	Hajnówka District	„Sursum Corda" Association	1 FLA/FCC
7.	Kolno District	Europartner Academic Club for European Integration	1 FLA/FCC
8.	City of Łomża	"Pryzmat" Social Activity Center	2 FLA/FCC
9.	Łomża District	Association for the Support of Citizens' Counseling	1 FLA/FCC
10.	Mońki District	Caritas of the Archdiocese of Białystok	1 FLA/FCC
11.	Sejny District	"Pryzmat" Social Activity Center	1 FLA/FCC
12.	Siemiatycze District	Europartner Academic Club for European Integration	1 FLA/FCC
13.	Sokółka District	"Sursum Corda" Association	1 FLA/FCC

[31] See: N. Kowal, *Tworzenie i rejestracja organizacji pożytku publicznego. Komentarz*, LEX 2005; H. Izdebski, *Ustawa o działalności pożytku publicznego i o wolontariacie. Komentarz*, Warszawa 2003, p. 27, http://bibliotekawolontariatu.pl/wpcontent/uploads/komentyna_do_ustawy_o_dzialanosci_pozytku_izdebski.pdf (1.05.2020).

14.	City of Suwałki	"Pryzmat" Social Activity Center	2 FLA
15.	Suwałki District	"Pryzmat" Social Activity Center	1 FLA/FCC
16.	Wysokie Mazowieckie District	"Sursum Corda" Association	1 FLA/FCC
17.	Zambrów District	"Pryzmat" Social Activity Center	1 FLA/FCC

* FLA/FCC – point of free legal assistance and/or free civic counseling
** FLA – point (s) of free legal assistance
*** FCC – point (s) of free civic counseling

Source: own study based on data provided by the Podlaski Voivode.

In 2019, in all districts and cities with district rights in the Podlaskie Voivodeship, seven organizations were selected, entrusted with running a total of twenty-seven points for free legal assistance and/or free civic counseling the following year. The most points (eight) were entrusted to the "Sursum Corda" Association with headquarters in Nowy Sącz, seven – the Center for Social Activity "Pryzmat" with headquarters in Suwałki, four – the Caritas of the Archdiocese of Białystok with headquarters in Białystok, three – the "Spe Salvi" Foundation in Białystok, two points – the "Gołębie Serce" Foundation with headquarters in Rzeszów and the Europartner Academic Club for European Integration with headquarters in Białystok, one point – the Association for the Support of Citizens' Counseling with headquarters in Łomża.

Conclusions

The conducted research shows that in 2019 in all districts and cities with district rights in the Podlaskie Voivodeship, open competitions were organized in the scope of running points of free legal assistance and/or free civic counseling and the abovementioned tasks were entrusted to public benefit organizations in 2020. However, it should be noted that not all selected entities have the status of non-governmental organizations. The Act on Free Legal Assistance does not contain a legal definition of this term, and its interpretation on the basis of the Act on Public Benefit and Volunteer Work excludes the possibility of entrusting the running of points to church organizations on the basis of the provisions of the Act on Free Legal Assistance, which clearly indicate that non-governmental organizations conducting public benefit activities are entitled to run points. Therefore, in the opinion of the authors, the provisions of the Act on Free Legal Assistance should be amended to extend their content to church organizations conducting public benefit activities.

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