THE ROLE OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN IMPLEMENTING SUSTAINABLE DEVELOPMENT STRATEGY OF HIGHER EDUCATION IN UKRAINE

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Abstract. *This research aims to analyze modern problematicity of examining and evaluating ICT role in implementing sustainable development strategy of higher education in Ukraine. Education for sustainable development is considered as a key instrument to achieve sustainable development goals and must respond to the 21st century challenges and aspirations as well as develop the right values and skills that will lead to sustainable and inclusive growth and peaceful coexistence; as an integral part of quality education, inherent in the lifelong learning concept. It has proved that various technology-based learning resources have become the new favorites of research and educational practice; they revolutionized the field of education. ICT integration in education is considered as having the potential to transform teaching and learning practices; it intensifies both teaching and learning processes, the quality and accessibility of education, learning environment, learning motivation, the scholastic performance; it increases the speed of perception, understanding, and the huge knowledge depth. In the research terms, it has been specified that ICT pose different challenges (lack of technical knowledge, training experience, limited ICT tools, poorer physical health, and increased vulnerability to cyberbullying, suicide, binge drinking, etc.)*

Key words: *information and communication technologies, higher education, sustainable development, sustainable development strategy, sustainable development goals.*

Introduction. Today's world is highly integrated, internationalized and characterized by complexity, large-scale, multi-vector and dynamism, creating new challenges to prepare a person for life; it requires people to think innovatively and alternately, to act comprehensively, to be much more mobile professionally and geographically than before, and, therefore, to provide systematic and effective lifelong learning. Learning technology, based on openness, innovation, creativity, perspective, defines a strategic concept to form a modern specialist, his general theoretical and practical training, professional level, personal qualities. According to

U-Report Ukraine Youth Survey, teachers' training affects the quality of education (44% of respondents) as well as education systems that need to be reformed (36% of respondents). It is also worth noting that education is one of Human Development Index components together with GDP per capita and life expectancy. Therefore, currently, global strategic trend is to develop a dynamic concept of education for sustainable development (hereinafter – ESD) that requires solid,

deep and extensive scientific and theoretical foundations and as broad education and awareness-raising efforts as possible.

Ukraine's informatization strategy is formed taking into account long-term state priorities of socio-economic, scientific, technical, national and cultural development and world achievements, aimed at solving the most important social problems and creating conditions for Ukraine's integration into the global information space; it also requires the introduction of scientifically sound techniques and methods of using information and communication technologies (hereinafter – ICT) in the professionally-oriented activities of teaching staff. The new Law of Ukraine "On Education" was passed, transition to 12-year model of learning was initiated, New Ukrainian School was born, Global Teacher Prize Ukraine was held for the first time, the Law of Ukraine "On Inclusive Education" was adopted (2017); Ukraine participated in PISA for the first time (2018); the start of voluntary EIE (external independent evaluation) for teachers (2019); distance learning (2020); blended learning (2021). Over the years of independent Ukraine, each generation of undergraduate and graduate students has experienced significant educational transformations that have had to change both teaching and learning contents.

Materials & methods of research. The objective of the research is to examine and evaluate ICT role in implementing sustainable development strategy (hereinafter – SDS) of higher education in Ukraine. To achieve the stated objective, a system of the following theoretical and research methods was used: analysis of national and foreign researchers' scientific publications to determine the current status of the issue raised in pedagogical theory; comparative analysis of definitions of key terms, such as "sustainable development", "ICT" to compare researchers' views on implementing SDS of higher education in Ukraine; generalization of modern teach-ing practices in higher educational establishments of Ukraine; objectivity, validity and reliability; formal-logical method to identify competencies, on which Ukraine's higher ESD is based.

Analysis of recent researches and publications). Both foreign and national researchers, who have made a significant contribution to ESD research, have laid principle theoretical and practical backgrounds have conducted researches of ICT role in implementing SDS of higher education in Ukraine. Among them we may distinguish Barth M., Godemann J., Rieckmann M., Stoltenberg U. (2007), De Kraker J., Cörvers R. J. M., & Lansu A. (2014), *Gizaw M. E. & Tessema G. W. (2020),* Hasiuk I., Darmanska I., Mykhaskova M., Pisotska L., & Sukhovirskyi O. (2022), Hudima T., & Malolitneva V. (2020), Paziura N. V., Kodalashvili O. B., Bozhok O. S., Romaniuk V. L., & Zlatnikov V. H. (2021), Vitchenko A., Vitchenko A., Zamotaieva N., Khrystiuk S., Nikolayenko V. (2022), Vyas-Doorgapersad S. (2022), Zhang H. & Zeng Y. (2022) and others. They provide various insights into ICT role in education; assessment of sustainable development of the educational sphere of Ukraine in the paradigm of European integration processes; conceptual and legal framework for promotion of ESD; English teaching in distant education policy development; UNESCO: ESD Goals; designing integral learning outcomes in higher education within the frameworks of the competency-based approach; the use of digitalization (ICTs) in achieving SDG; the ESD, online technology and teleological rationality, etc.

Results of the research and their discussion. In September 2015, within the 70th session of the UN General Assembly framework, the UN Summit on Sustainable Development [5] and the Post-2015 Development Agenda adoption was held in New York, at which new development benchmarks were approved. It is worth noting that education has been a top priority for the United Nations Educational,

Scientific and Cultural Organization since 1992. The summit's final document, "Transforming Our World: the 2030 Agenda for Sustainable Development," [11] approved 17 Sustainable Development Goals and 169 targets as well as defined the universal, transformational and inclusive Sustainable Development Goals (hereinafter – SDGs) as ambitious and universal agenda to meet major development challenges for humanity. In 2015, the Future of Education and Skills 2030: OECD Learning Compass 2030 project was launched by the Organization for Economic Cooperation and Development; it offered forms, visions and principles underlying the future of global education and science and aimed to help countries prepare their education systems for the future. The project consists of seven elements: core foundations, transformative competences, student agency, knowledge, skills, attitudes and values, anticipation-action-reflection cycle and focuses on (1) developing students' competencies (knowledge, skills, attitudes and values) in the first phase (2015-19); (2) designing learning environments that can nurture such competencies, i.e. how to implement curricula effectively in the second phase (2019 and beyond) [9].

ESD is a key instrument to achieve SDGs that must respond to the 21st century challenges and aspirations as well as develop right values and skills that will lead to sustainable and inclusive growth and peaceful coexistence. Zhang et al (2022) consider ESD as "(1) a world where everyone has the opportunity to benefit from quality education and to learn values, behavior and lifestyles required for a sustainable future and for positive social transformations; (2) a vision of education that seeks to balance human and economic well-being with cultural traditions and respect for the Earth's natural resources; (3) it contains 5 key dimensions, such as the value of sustainable development, personal and social values, teaching meth-

ods, curriculum, structure and organization; (4) focused on disseminating knowledge and theories about sustainable development, promoting students' sustainable development ethics and humanistic consciousness and improving their awareness, skills and practical ability to implement sustainable development". The authors also note, "Various technology-based learning resources (MOOCs, SPOCs, blockchain, cloud technologies, flipped classrooms, micro lessons, mixed teaching) have become the new favorites of research and educational practice and revolutionized the field of education" [14].

According to German researchers (Barth et al, 2007) sustainable development is considered as a normative framework for selecting key competencies in both formal (orientation towards interdisciplinarity, strengthening self-reliance and self-direction in the learning process) and informal (self-directed learning, incidental/experimental learning, socialization) learning settings. They state, "A culture of teaching should be superseded by a culture of learning that combines the learning processes in academic formal and informal settings and that includes competencies developed in extra-curricular settings" [3].

SDG 4, on inclusive and quality education encourages lifelong learning for all based on cognitive, socio-emotional and behavioral learning objectives. As De Kraker et al (2014) claim, "Lifelong learning skills are seen as an essential part of competences, as both the 'state-of-the-art' and professional requirements are rapidly changing. The authors note, "The best way to acquire these competences is in learning environment that combines actual practice ('learning by doing'), and explicit reflection on what and how to learn from that practice ('learning by reflection')'and prove that "the concept of competence-based learning offers an appropriate didactic framework for higher ESD, in which the acquisition of transboundary competence is seen as central" [4].

Ukraine, like other UN member-states, has joined the global sustainable development process. The aim of reforming higher education in Ukraine is to create an attractive and competitive national system of higher education, integrated into the European educational and scientific space. An inclusive process of adapting SDGs was initiated to establish strategic frameworks for Ukraine's national development by 2030. Each global goal was regarded taking into account national specifics. Achieving inclusive and equitable quality education for all (ESD, global citizenship education, global learning, political education, ethno-moral education, environmental education, gender education, intercultural education, human rights education) reaffirms the belief that education is one of the most powerful and proven means for implementing SDS. It also aims to provide equal access to affordable vocational training, to eliminate gender and wealth disparities, and achieve universal access to quality higher education [2].

The Strategy for the 2022-2032 Development of Higher Education in Ukraine [1] is aimed at achieving SDGs in Ukraine for the period until 2030 approved by Presidential Decree No. 722 of September 30, 2019 [2]. In particular, the Strategy meets Ukraine's obligations as a member of European Higher Education Area (hereinafter – EHEA); it respects the Bologna Process key principles, enshrined in the Grand Charter of Universities (Bologna, 1988) and the Joint Declaration of the Ministers of Education of Europe "EHEA" of June 19, 1999 on promoting citizens' mobility for further study or employment in a single EHEA, increasing compatibility and comparability of higher education systems for member-states, its competitiveness. It also is in line with provisions for developing an inclusive, innovative and interconnected EHEA by 2030, according to the Rome Ministerial Communiqué of November 19, 2020, the Convention on the Recognition of Qualifications for Higher Education in the European Region (Lisbon, April 11, 1997), the provisions of the Global Convention on the Recognition of Qualifications in Higher Education, adopted at the 40th session of the UNESCO General Conference (Paris, November 12-27, 2019), article 3 of the Law of Ukraine "On Higher Education".

Ministry of Education and Science of Ukraine pays great attention to ICT integration into all educational processes: since 2005 proper strategies have been declared, educational establishments have been computerized, teachers and students have been acquainted with new digital technologies, distance learning methods, etc. Some researchers (Paziura et al., 2021) outline transformational trends of Ukraine's integration towards EHEA and claim, "Obtaining higher education through distance learning is enshrined in Ukrainian legislation, namely, in the Law of Ukraine "On Higher Education" (2014), the Regulation "On Distance Education" (2013), Order of the Ministry of Science and Education of Ukraine from 07.07.2000, №293 "On the establishment of the Ukrainian Centre for Distance Education" (2000)" [10].

Modern ICT in education reflect one of the most important and sustainable trends in global learning. New ICT (cloud computing, computer testing, e-textbooks, PowerPoint presentations, interactive whiteboard, multimedia projector, teacher's computer, webcam, data transmission system, adapter, consoles, wireless microphone systems, interactive wireless tablet, Internet data-resources, online dictionaries, Zoom, Google Classroom, Microsoft Teams, Cisco Webex platforms, etc.) make it possible to intensify and enhance both teaching and learning processes, the quality and accessibility of education, learning environment, learning motivation, the scholastic performance, to increase the speed of perception, understanding, and the huge knowledge depth.

According to Gizaw et al (2020), "ICT integration in education is viewed as

having the potential to transform teaching and learning practices". The researchers also outline ICT advantages and disadvantages as well. Among ICT advantages in education they distinguish between the following: "(1) ICT help enhancing education quality with advanced teaching methods, improving integral learning outcomes and enabling reforms or better education management; (2) ICT increase flexibility so that learners can access the education regardless of time and geographical barriers; (3) ICT offer a lot of materials and communication opportunities to improve teaching and learning activities; (4) positive perceptions of teachers, learners and administrators on the use of ICT tools in teaching and learning practices." At the same time, they claim that ICT effective integration in education poses different challenges (lack of technical knowledge, training experience, limited ICT tools, poorer physical health, and increased vulnerability to cyberbullying, suicide, and binge drinking) [6].

As noted in S. Vyas-Doorgapersad's paper, "ICT is the essential infrastructure platform for SDGs; a paradigm shift in public administration discipline that emerged around 1995 and has now become increasingly dominant (computers, television, network hardware and software, satellite systems, e-education, e-health, e-commerce, cell phones and e-filling)" [13].

Ukrainian researchers (Hudima et al, 2020) pay special attention to the essence of ESD both worldwide and in Ukraine noting, "Education is a critical element to overcome poverty; various educational projects and programs enhance the skills and abilities to use natural resources more effectively and help improve energy efficiency and use of renewable energy sources; there is a direct link between such areas as economic growth, entrepreneurship, skills needed in the labor market and education; education can make a significant change in production models, give preference to more sustainable goods and

prevent wastes". They also emphasize, "To upgrade Ukraine's education system, it is appropriate to develop the National Strategy on ESD and its implementation plan based on global SDGs. It is required to switch from traditional education to the model focused on sustainable development with the underlying extensive interdisciplinary knowledge based on an integrated approach to develop society, economy, and environment" [8].

The issue of reforming Ukraine's education sector by implementing advanced global practices and standards is of vital importance, but it meets a number of challenges. The results of the research conducted by Ukrainian researchers (Hasiuk et al, 2022) has shown that "achieving positive change in ESD is only possible with a systemic approach encompassing reforms at all levels of management. It is extremely important 1) to improve both the valid legislation regulating Ukraine's education in EHEA, its content, training of rectors and faculty in accordance with the best European educational practices; 2) to focus education reforms on improving the material and technical base, financial support, faculty's decent remuneration and enhancing their social status and prestige of teaching and scientific professions; 3) to improve valid educational legislation aimed at increasing universities' autonomy, to bring ICT in line with international standards" [7].

Thus, having analyzed many data on the issue raised, we may conclude that sustainable development requires the comprehensive and dynamic educational approach that takes into account the importance of critical thinking, social learning and involvement in community life, promoting peaceful coexistence in freedom and prosperity and an enabling environment for present and future generations.

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РОЛЬ ІНФОРМАЦІЙНО-КОМУНІКАЦІЙНИХ ТЕХНОЛОГІЙ В РЕАЛІЗАЦІЇ СТРАТЕГІЇ СТАЛОГО РОЗВИТКУ ВИЩОЇ ОСВІТИ УКРАЇНИ
Христюк С. Б., Цимбал С. В.

Анотація. *Дане дослідження присвячено аналізу сучасної проблематики вивчення та оцінки ролі інформаційно-комунікаційних технологій у реалізації стратегії сталого розвитку вищої освіти України. Концепт «освіта для сталого розвитку» розглядається як ключовий інструмент для досягнення цілей сталого розвитку і має відповідати на виклики та прагнення 21-го століття, а також розвивати правильні цінності та навички, які призведуть до сталого та інклюзивного зростання, мирного співіснування; як невід'ємна частина якісної освіти, властива для концепції навчання впродовж життя. Інформаційно-комунікаційні технології розглядаються як важлива інфраструктурна платформа для цілей сталого розвитку; зміна парадигми в дисципліні державного управління, яка виникла близько 1995 року і зараз стає все більш домінуючою. Виявлено, що сталий розвиток вимагає комплексного та динамічного освітнього підходу, який враховує важливість критичного мислення, соціального навчання та участі у житті громади, мирного співіснування в умовах свободи та процвітання, формування сприятливого середовища для нинішнього та майбутніх поколінь. Доведено, що різноманітні технологічні навчальні ресурси стали новими фаворитами дослідницької та освітньої практики та революціонізували сферу освіти. Вважається, що інтеграція ІКТ в освіту має потенціал для трансформації практики викладання та навчання; інтенсифікує процес викладання та навчання, якість і доступність освіти, освітнє середовище, навчальну мотивацію, успішність у навчанні; збільшує швидкість сприйняття, розуміння і величину знань. В межах дослідження визначено, що інформаційно-комунікаційні технології також створюють різні проблеми, зокрема, через відсутність технічних знань, досвіду навчання, обмеженість засобів інформаційно-комунікаційних технологій, погіршення фізичного здоров'я та підвищену вразливість до кіберзалякування, самогубства, пияцтва, тощо.*

Ключові слова: інформаційні та комунікаційні технології, вища освіта, сталий розвиток, стратегія сталого розвитку, цілі сталого розвитку.